HISTORY OF SOYBEANS AND SOYFOODS
IN AUSTRALIA, NEW ZEALAND
AND OCEANIA (1770-2010):

EXTENSIVELY ANNOTATED

BIBLIOGRAPHY AND SOURCEBOOK

HISTORY OF SOYBEANS AND SOYFOODS IN AUSTRALIA, NEW ZEALAND AND OCEANIA (1770-2010):

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Australia, Fiji, French Polynesia (incl. Tahiti), Guam
Kiribati, Marshall Islands, Micronesia, Nauru, New Zealand,
Palau Isl., New Caledonia, Samoa (American), Samoa, Wallis and Futuna,
Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu

Compiled
by
William Shurtleff & Akiko Aoyagi

SOYINFO CENTER

2010

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History of Soy in New Zealand
History of Soy in Palau Islands
History of Soy in New Caledonia
History of Soy in Samoa (American)
History of Soy in Samoa
History of Soy in Wallis and Futuna

Contents

Page

Dedication and Acknowledgments 6

Introduction and Brief Chronology, by William Shurtleff 7

About This Book 9

Abbreviations Used in This Book 10

How to Make the Best Use of This Digital Book - Search It! 11

Maps of Australia and New Zealand 13-14

History of Soy in Australia, New Zealand, and Oceania: 1,713 References in Chronological Order 15

7 photographs and illustrations on pages 34, 37, 52, 53, 151, 228

Subject/Geographical Index by Record Numbers 480

Last page of Index 544

DEDICATION AND ACKNOWLEDGMENTS

This book is dedicated to F.G. Roberts, who pioneered both soybeans and soyfoods in Australia. And to the current generation of soyfoods makers down under.

Part of the enjoyment of writing a book lies in meeting people from around the world who share a common interest, and in learning from them what is often the knowledge or skills acquired during a lifetime of devoted research or practice. We wish to give deepest thanks...

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■Finally our deepest thanks to Tony Cooper of San Ramon, California, who has kept our computers up and running since Sept. 1983. Without Tony this series of books on the Web would not have been possible.

This book, no doubt and alas, has its share of errors. These, of course, are solely the responsibility of William Shurtleff.

INTRODUCTION

Brief Chronology of Soy in Oceania

1770 – Australia: Joseph Banks and Daniel Solander, on Captain Cook's first voyage around the world in H.M.S. *Endeavour*, find two species of wild perennial soybeans (*Glycine tabacina* and *Glycine tomentosa*) growing, first at Botany Bay (April, in today's New South Wales), then, as Cook sailed northward, at Bustard Bay, Bay of Inlets, and Endeavour's River (June, in today's Queensland) (Banks & Solander 1900, Vol. 1, p. 22).

1804 – Australia: "Fine India Soy" [sauce] is sold in Sydney, the first soy product sold in Australia or in Oceania (Driver 1804).

1837 – Australia: Bentham describes three wild perennial soybeans found in Australia, incl. *Glycine clandestina*.

1842 Feb. – New Zealand: India soy [sauce] is sold in Wellington, the first soy product sold in New Zealand (*New Zealand Gazette and Wellington Spectator* 1842).

1846 May 9 – New Zealand: Worcestershire Sauce (of which soy sauce is a major ingredient) is sold in New Zealand, the 2nd soy product sold in New Zealand and the first Worcestershire Sauce sold in Oceania (Lea and Perrins 1846).

1855 – Australia: The gold rush, which began in 1851 in New South Wales, had by 1855 attracted an estimated 17,000 Chinese to the goldfields. They almost certainly brought soybeans with them for food, and perhaps for cultivation. By 1861 there were 40,000 Chinese in Australia. Unfortunately no one has yet studied existing records from this and subsequent gold rushes from this viewpoint (*A Land of Immigrants* 1985).

1858 April 24 – Australia: B. Towns and Co. (Melbourne) advertises that the following Chinese goods are for sale, imported from Hong Kong: "Beanstick" [probably dried yuba], "white beans curd" [tofu], and "pickle beans curd" [probably fermented tofu]. This is the first time any of these three soyfoods have been mentioned in Australia or Oceania. They will probably be consumed by Chinese who came to Australia as part of the gold rush (*The Argus*, Melbourne 1858).

1859 April – Australia: A letter to the editor states that the soybean (*soja hispida*), the most important pulse crop grown in the Southern Hemisphere, "might either be successfully cultivated here or profitably imported" (*The Courier*, Hobart, Tasmania, Australia).

1864 – Australia: Six wild perennial soybeans growing in Australia are described by Bentham and Mueller.

1868 – Hawaiian Islands: Soyfoods appear in the form of miso and shoyu brought by the first group of Japanese emigrants from Yokohama, Japan (*Diary of Yonekichi Sakuma*).

1875 – Australia: Shih (1918) says that soy beans were "introduced into Australia in 1875." Unfortunately he cites no source.

1879 April – Australia: Soybeans (including black soybeans) first arrive in Australia, a gift from the Minister of the Interior Department, Japan. By 19 May 1879 they are available for distribution to farmers (*Brisbane Courier*, Queensland, 1879).

1879 – Australia: Japan: A classified and descriptive catalogue of a collection of agricultural products exhibited in the Sydney international exhibition by the Imperial College of Agriculture, Tokio, Japan, by Edward Kinch (65 p.) discusses soybeans and most traditional Japanese soyfoods, including tofu, frozen tofu, miso.

1881 April 28 – Australia: Wm. Filmer of West Maitland, NSW, advertises that his 2nd shipment of autumn seeds has arrived by mail steamer; it includes "Soya Bean" (*Maitland Mercury & Hunter River General Advertiser*, New South Wales, Australia 1881).

1882 Jan. 14 – Australia: Palmer encourages production of soybeans in Australia and suggests that he may even have tried to cultivate them there (*Gardener's Chronicle*).

1882 Jan. 21 – New Zealand: M. Roman, a French engineer, notes the many food uses of "the soja or soya" – for miso soup, tofu, and a coffee alternative. He adds that "the cultivation of the interesting plant… has been largely developed in Hungary and various parts of France" (*Otago Witness* 1882).

1882 Dec. – New Zealand: The Japannese [sic, Japanese] "Soja bean" is now in New Zealand and being sold in a seed catalogue by Robt. Gardner & Co. (*Evening Post*, Wellington, New Zealand 1882).

1883 Oct. – New Zealand: Soybeans are first clearly cultivated by Mr. James Laird in Wanganui (*Wanganui Chronicle* 1883).

1889 May – New Zealand: Gawne's Worcestershire sauce is now being made in Dunedin, New Zealand, and advertised as "Equal to imported at half the price." It is not known whether (like Lea & Perrins') this Worcestershire sauce uses soy sauce as its main ingredient. If it does, it would be the earliest soyfood product made in New Zealand or (perhaps) all of Oceania (*Southland Times*, Otago, New Zealand 1889).

1891 – Australia: The soy bean is first clearly cultivated in Australia, and all of the early experiments are described in the *Agricultural Gazette of New South Wales* (Turner 1891).

1910 – New Zealand: Soybeans are first cultivated at Tauranga (Clifton 1911).

1920 – Guam: Soybeans are first cultivated (Briggs 1922).

1926 – Fiji: Soy beans are first cultivated (Parham 1949).

1928 – New Caledonia and Dependencies (Territory of): Soybeans are first cultivated (Kaltenbach 1936).

1936 – Papua New Guinea: Soybeans are first cultivated (Sampson 1936).

1936 – Australia: The first commercial soyfood product is manufactured in Australia by soy pioneer F.G. Roberts – Roberts Soy-Wheat Macaroni.

1945 – Micronesia, Federated States of: Soybeans are first cultivated (Bascom 1946).

1957 – Solomon Islands: Soybeans are first cultivated (British Solomon Islands Protectorate, Dep. of Agriculture).

1960 – Marshall Islands, and Vanuatu: Soyfoods first appear in the form of Multi-Purpose Food (Meals for Millions 1963).

1971 – Tonga: Soybeans are first cultivated (Anders 1976).

1975 – Tahiti: Soybeans are first cultivated in French Polynesia (Lambert 1976; Whigham 1978).

1976 – Vanuatu: Soybeans first cultivated (Judy 1978).

1978 – Kiribati, Nauru, Tuvlau: Soy first appears in the form of soy sauce (Wood 1982).

1979 – Samoa: Soybeans first cultivated (Fernando 1980).

1980 – New Zealand: Soyfoods are first made by Harvest Whole Foods, in the form of tofu.

2010 - Current Status of Soybean Production in Oceania: Australia is the only country in Oceania that has ever produced significant amounts of soybeans. Yet they are a small producer, ranking about 30th worldwide in total annual production. In the year 2000 they produced about 175,000 metric tons (tonnes), yet by 2002 their production had fallen dramatically to 55,000 tonnes, dropping to 45,000 in 2004 and 2006 (in large part because of severe drought since 2003) then rising to about 70,000 by 2008. As of 2009 the worst drought on record in Australia continues.

F.G. Roberts

ABOUT THIS BOOK

This is the most comprehensive book ever published about the history Soybeans and Soyfoods in Oceania. It has been compiled, one record at a time over a period of 34 years, in an attempt to document the history of soy in this region. It is also the single most current and useful source of information on this subject.

This is one of more than 50 books compiled by William Shurtleff and Akiko Aoyagi, and published by the Soyinfo Center. It is based on historical principles, listing all known documents and commercial products in chronological order. It features detailed information on:

- 53 different document types, both published and unpublished.
- 1,363 published documents - extensively annotated bibliography. Every known publication on the subject in every language.
- 136 original Soyinfo Center interviews and overviews never before published.
- 261 unpublished archival documents
- 230 commercial soy products.

Thus, it is a powerful tool for understanding the development of this subject from its earliest beginnings to the present.

Each bibliographic record in this book contains (in addition to the typical author, date, title, volume and pages information) the author's address, number of references cited, original title of all non-English language publications together with an English translation of the title, month and issue of publication, and the first author's first name (if given). For most books, we state if it is illustrated, whether or not it has an index, and the height in centimeters.

For commercial soy products (CSP), each record includes (if possible) the product name, date of introduction, manufacturer's name, address and phone number, and (in many cases) ingredients, weight, packaging and price, storage requirements, nutritional composition, and a description of the label. Sources of additional information on each product (such as advertisements, articles, patents, etc.) are also given.

A complete subject/geographical index is also included.

ABBREVIATIONS USED IN THIS BOOK

A&M = Agricultural and Mechanical
Agric. = Agricultural or Agriculture
Agric. Exp. Station = Agricultural Experiment Station
ARS = Agricultural Research Service
ASA = American Soybean Association
Assoc. = Association, Associate
Asst. = Assistant
Aug. = August
Ave. = Avenue
Blvd. = Boulevard
bu = bushel(s)
ca. = about (circa)
cc = cubic centimeter(s)
Chap. = Chapter
cm = centimeter(s)
Co. = company
Corp. = Corporation
Dec. = December
Dep. or Dept. = Department
Depts. = Departments
Div. = Division
Dr. = Drive
E. = East
ed. = edition or editor
e.g. = for example
Exp. = Experiment
Feb. = February
fl oz = fluid ounce(s)
ft = foot or feet
gm = gram(s)
ha = hectare(s)
i.e. = in other words
Inc. = Incorporated
incl. = including
Illust. = Illustrated or Illustration(s)
Inst. = Institute
J. = Journal
J. of the American Oil Chemists' Soc. = Journal of the American Oil Chemists' Society
Jan. = January
kg = kilogram(s)
km = kilometer(s)
Lab. = Laboratory
Labs. = Laboratories
lb = pound(s)
Ltd. = Limited
mcg = microgram(s)
mg = milligram(s)
ml = milliliter(s)
mm = millimeter(s)
N. = North
No. = number or North
Nov. = November
Oct. = October
oz = ounce(s)
p. = page(s)
P.O. Box = Post Office Box
Prof. = Professor
psi = pounds per square inch
R&D = Research and Development
Rd. = Road
Rev. = Revised
RPM = revolutions per minute
S. = South
SANA = Soyfoods Association of North America
Sept. = September
St. = Street
tonnes = metric tons
trans. = translator(s)
Univ. = University
USB = United Soybean Board
USDA = United States Department of Agriculture
Vol. = volume
V.P. = Vice President
vs. = versus
W. = West
°C = degrees Celsius (Centigrade)
°F = degrees Fahrenheit
> = greater than, more than
< = less than

HOW TO MAKE THE BEST USE OF THIS DIGITAL BOOK

The Most Important Thing: The **KEY** to using this book is to **SEARCH IT** using the powerful built-in search engine, as follows:

On the toolbar at the top of every page, on the far right end is a rectangular white box with the word "Find" in it.

Click the down-pointing arrow to the right of that box to get a menu.

Click "Open Full Acrobat Search."

On the left side of your screen a "Search" box will open up.

When asked: "What word or phrase would you like to search for?" type that word or phrase in the box. For example: Zavitz or Noble Bean. No need to use quotation marks. Then click "Search."

At "Results" click any line that interests you.

Chronological Order: The publications and products in this book are listed with the earliest first and the most recent last. Within each year, references are sorted alphabetically by author. If you are interested in only current information, you might want to start reading at the back, just before the indexes.

A Reference Book: Like an encyclopedia or any other reference book, this work is meant to be searched first - to find exactly the information you are looking for - and then to be read.

How to Use the Index: A subject and country index is located at the back of this book. It will help you to go directly to the specific information that interests you. Browse through it briefly to familiarize yourself with its contents and format.

Each record in the book has been assigned a sequential number, starting with 1 for the first/earliest reference. It is this number, not the page number, to which the indexes refer. A publication will typically be listed in each index in more than one place, and major documents may have 30-40 subject index entries. Thus a publication about the nutritional value of tofu and soymilk in India would be indexed under at least four headings in the subject and country index: Nutrition, Tofu, Soymilk, and Asia, South: India.

Note the extensive use of cross references to help you: e.g. "Bean curd. See Tofu."

Countries and States/Provinces: Every record contains a country keyword. Most USA and Canadian records also contain a state or province keyword, indexed at "U.S. States" or "Canadian Provinces and Territories" respectively. All countries are indexed under their region or continent. Thus for Egypt, look under Africa: Egypt, and not under Egypt. For Brazil, see the entry at Latin America, South America: Brazil. For India, see Asia, South: India. For Australia see Oceania: Australia.

Most Important Documents: Look in the Index under "Important Documents -."

Organizations: Many of the larger, more innovative, or pioneering soy-related companies appear in the subject index – companies like ADM / Archer Daniels Midland Co., AGP, Cargill, Dupont, Kikkoman, Monsanto, Tofutti, etc. Worldwide, we index many major soybean crushers, tofu makers, soymilk and soymilk equipment manufacturers, soyfoods companies with various products, Seventh-day Adventist food companies, soy protein makers (including pioneers), soy sauce manufacturers, soy ice cream, tempeh, soynut, soy flour companies, etc.

Other key organizations include Society for Acclimatization (from 1855 in France), American Soybean Association, National Oilseed/Soybean Processors Association, Research & Development Centers (Peoria, Cornell), Meals for Millions Foundation, and International Soybean Programs (INTSOY, AVRDC, IITA, International Inst. of Agriculture, and United Nations). Pioneer soy protein companies include Borden, Drackett, Glidden, Griffith Labs., Gunther, Laucks, Protein Technologies International, and Rich Products.

Soyfoods: Look under the most common name: Tofu, Miso, Soymilk, Soy Ice Cream, Soy Cheese, Soy Yogurt, Soy Flour, Green Vegetable Soybeans, or Whole Dry Soybeans. But note: Soy Proteins: Isolates, Soy Proteins: Textured Products, etc.

Industrial (Non-Food) Uses of Soybeans: Look under "Industrial Uses ..." for more 17 subject headings.

Pioneers - Individuals: Laszlo Berczeller, Henry Ford, Friedrich Haberlandt, A.A. Horvath, Englebert Kaempfer, Mildred Lager, William Morse, etc. Soy-Related Movements: Soyfoods Movement, Vegetarianism, Health and Dietary Reform Movements (esp. 1830-1930s), Health Foods Movement (1920s-1960s), Animal Welfare/ Rights.

These are indexed under the person's last name or movement name.

Nutrition: All subjects related to soybean nutrition (protein quality, minerals, antinutritional factors, etc.) are indexed under Nutrition, in one or more of 14 subcategories.

Soybean Production: All subjects related to growing, marketing, and trading soybeans are indexed under Soybean Production. E.g. Soybean Production: Nitrogen Fixation, or Soybean Production: Plant Protection, or Soybean Production: Variety Development.

Other Special Index Headings: Browsing through the subject index will show you many more interesting subject headings, such as Industry and Market Statistics, Information (incl. computers, databases, libraries), Standards, Bibliographies (works containing more than 50 references), and History (soy related).

Commercial Soy Products: All Soyinfo Center sourcebooks that focus on a specific soyfood (tofu, soymilk, tempeh, miso, etc.) or geographical area (Africa, Japan) contain extensive information about every known commercial soyfood product - a unique feature. We list the product name, manufacturer's name, address, and phone number, year and month of introduction, ingredients, weight-packaging-price, how stored, nutritional analysis, and documentation on sources of additional information on that product.

SoyaScan Notes: This is a term we have created exclusively for use with this database. A SoyaScan Notes Interview contains all the important material in short interviews conducted and transcribed by William Shurtleff. This material has not been published in any other source. Longer interviews are designated as such, and listed as unpublished manuscripts. A transcript of each can be ordered from Soyinfo Center Library. A SoyaScan Notes Summary is a summary by William Shurtleff of existing information on one subject.

"Note:" When this term is used in a record's summary, it indicates that the information which follows it has been added by the producer of this database.

Asterisks at End of Individual References.

1. An asterisk (*) at the end of a record means that Soyinfo Center does not own that document. Lack of an asterisk means that Soyinfo Center owns all or part of the document.
2. An asterisk after eng (eng*) means that Soyinfo Center has done a partial or complete translation into English of that document.
3. An asterisk in a listing of the number of references [23* ref] means that most of these references are **not** about soybeans or soyfoods.

Documents Owned by Soyinfo Center. Lack of an * at the end of a reference indicates that the Soyinfo Center Library owns all or part of that document. We own roughly three fourths of the documents listed. Photocopies of hard-to-find documents or those without copyright protection can be ordered for a fee. Please contact us for details.

Document Types: The SoyaScan database contains 51 different types of documents, both published (books, journal articles, patents, annual reports, theses, catalogs, news releases, videos, etc.) and unpublished (interviews, unpublished manuscripts, letters, summaries, etc.).

Customized Database Searches: This book was printed from SoyaScan, a large computerized database produced by the Soyinfo Center. Customized/personalized reports are "The Perfect Book," containing exactly the information you need on any subject you can define, and they are now just a phone call away. For example: Current statistics on tofu and soymilk production and sales in England, France, and Germany. Or soybean varietal development and genetic research in Third World countries before 1970. Or details on all tofu cheesecakes and dressings ever made. You name it, we've got it. For fast results, call us now!

BIBLIO: The software program used to produce this book and the SoyaScan database, and to computerize the Soyinfo Center Library is named BIBLIO. Based on Advanced Revelation, it was developed by Soyinfo Center, Tony Cooper and John Ladd.

History of Soybeans and Soyfoods: Many of our books have a corresponding chapter in our forthcoming scholarly work titled History of Soybeans and Soyfoods (4 volumes). Manuscript chapters from that book are now available, free of charge, on our website, www.soyinfocenter.com.

About the Soyinfo Center. An overview of our publications, computerized databases, services, and history is given on our website.

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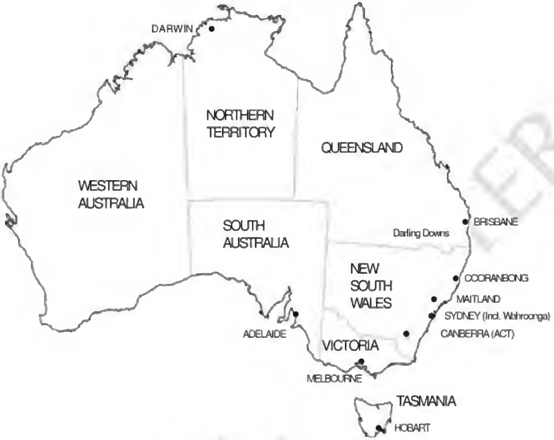
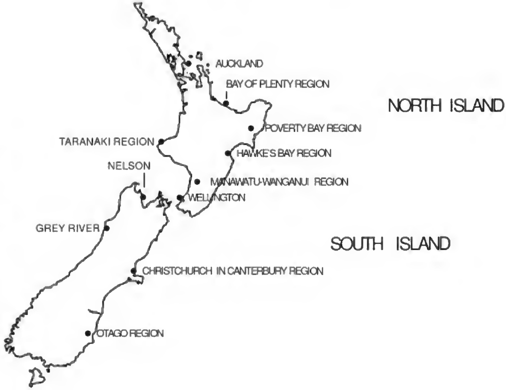
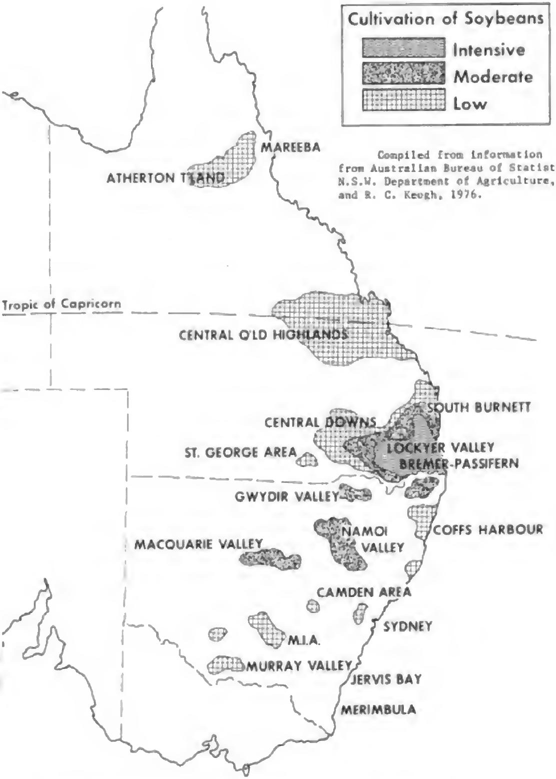
MAPS OF AUSTRALIA AND NEW ZEALAND







Compiled from information
from Australian Bureau of Statistics,
N.S.W. Department of Agriculture,
and R. C. Keogh, 1976.

Approximate Distribution and Intensity of Soybean Cultivation in Australia

HISTORY OF SOYBEANS AND SOYFOODS IN AUSTRALIA, NEW ZEALAND AND OCEANIA

1. Banks, Joseph. 1770. Journal during Captain Cook's first voyage in H.M.S. *Endeavour* in 1768-71 to Terra del Fuego, Otahite, New Zealand, Australia, the Dutch East Indies, etc. (Log–unpublished). Australia. *

• ***Summary:*** In 1900 a book titled *Illustrations of the Botany of Captain Cook's Voyage Round the World in H.M.S. Endeavor in 1768-71*, by Joseph Banks and Daniel Solander was published in London by the British Museum (Natural History). Banks and Solander went on the voyage, and Banks kept a log of the voyage, which is now in the British Museum. In Vol. 1 on page 22, under Australian Plants, plates 66 and 67 depict *Glycine tabacina* and *Glycine tomentosa* which are wild perennial relatives of the soybean. The plants were collected in Australia in 1770, first at Botany Bay in New South Wales (April 1770), then (as Cook sailed northward) at Bustard Bay, Bay of Inlets, and Endeavor's River (June 1770) in today's Queensland.

Note 1. If we take the date of collection (1770) rather than the date of publication (1900) as being the date the of document, this would be the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in Australia or Oceania; cultivated soybeans had not yet been reported by 1770.

Note 2. This work was first cited in Oct. 1994 in a personal communication from Prof. Ted Hymowitz of the University of Illinois.

Note 3. This book is part of a 3-volume set. Volumes 1 and 2 have the same title, as shown above. Vol. 3 has the title: *Illustrations of Australian plants collected in 1770 during Captain Cook's voyage round the world in the H.M.S. Endeavor.*

Note 4. Joseph Banks, born in 1774 in England, was the man who turned plant hunting into a profession. He had a large fortune at his disposal from the age of about 17 and his passion for botany dominated his long, full life. Banks persuaded the Royal Society of London to back him as the official naturalist on Captain James Cook's voyage to Tierra del Fuego, Tahiti, New Zealand, and Australia. The offer was accepted and he paid his own expenses and those of his party. In August 1768 he, along with the Swedish naturalist Dr. Daniel Solander (who had been trained by the great plant classifier Linnaeus), three artists and two servants, boarded the *Endeavour* commanded by Captain Cook. "On 19 April 1770 the coast of New South Wales was finally sighted... Sailing northwards, they found no harbor until the end of April, when they went ashore at Botany Bay, aptly named by Banks for its prodigal wealth of plants which kept him and Solander happy and busy for days." On June 19 they ran aground on the Great Barrier Reef and nearly sunk. "Three days later they found a safe harbor in the mouth of a river, today called the Endeavour River" where the ship was repaired. Banks and Solander used this time to botanize. They left the harbour on August 4, continuing on to New Guinea, the Dutch East Indies, and the Cape of Good Hope. "London lionized him [Banks] on his return." Later Banks sponsored the trips of many experienced, professional plant hunters. Captain Cook had successfully circumnavigated the world, and Banks was largely credited with the strong scientific flavor of the voyage. Banks later became unofficial director of Kew Gardens (Lyte 1983, p. 19-23).

2. Wendland, Johann Christoph. 1798. Botanische Beobachtungen nebst einigen neuen Gattungen und Arten [Botanical observations, including some new genera and species]. Hannover: bey den Gebruedern Hahn. 58 p. See p. 54. 32 x 20 cm. [Ger; Lat]

• ***Summary:*** "Classis XVII. Diadelphia Decandria. Zweibruedrige Zehnmännige [diadelphous]. Glycine clandestina. Die im Verborgenen bluehende Glyeine [The Glycine that blooms in seclusion or clandestinely]." There follows a 4-line botanical description in Latin, then a 10-line description of the plant in German: Homeland: South-sea islands (Suedsee-Inseln).

The book is dedicated to the esteemed fellow members of the Naturalist Society of Jena and Zurich.

Note 1. This is the earliest document seen (Jan. 2001) that mentions *Glycine clandestina* (pronounced glai-SEE-nee klan-duh- STAI-nuh). E.H. Walker (1976, p. 583) states that the meaning of the Latin species name of this plant is "hidden or unknown," probably referring to the obscure cleistogamous flowers. The author does not state specifically on which south-sea island or islands this plant grows. It was described by Bentham in 1864 as growing in many states of Australia.

Note 2. This is the 2nd earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in Oceania; cultivated soybeans have not yet been reported.

Note 3. Herrenhausen is a place (probably in today's Lower Saxony, northeast Germany) where Wendland works as the royal princely gardenmaster. He is a member of the natural-science societies of Jena and Zurich. Jena is in today's eastern Germany; Zurich is in Switzerland. Address: Koeniglich Churfuerstlicher Garten-Mesiter zu Herrenhausen und Mitgliede der Jenaischen und Zuericher naturforschenden Gesellschaften.

3. Driver (J.). 1804. For sale at the house of J. Driver, Chapel Row (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* March 18. p. 1.

• ***Summary:*** "Preserved Fruit of all kinds 1*s.* 6*d.* per lb.

"Fine India Soy [sauce], Best Green Tea 6*s.* per lb."

Note 1. This is the earliest document seen (March 2010) concerning soybean products (soy sauce) in Australia or Oceania. This document contains the earliest date seen for soybean products in Australia or Oceania (18 March 1804); soybeans as such have not yet been reported.

Note 2. This is the earliest of 230 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "India Soy." The newspaper in which this term appears most frequently is *The Argus* (Melbourne) (70 times). By category: 225 are advertising and 5 are news. By decade: In 1840-49 the term appears in the most ads or articles (95), followed by 1850-59 (66). Address: Chapel Row, [Sydney].

4. Lord (Mr.). 1804. To be sold by auction by Mr. Lord, at his warehouse in Sydney, on Monday the 20th instant, at eleven in the forenoon... George-street, at 12 o'clock... (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* Aug. 12. p. 2.

• ***Summary:*** "The residue of the investment imported by Captain Withers–Experiment: Consisting of... pickles of different kinds, comprising coratch, ketchup, capers, anchovies, and quin sauce,..."

Note 1. This is the earliest of 2,417 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "ketchup." The newspaper in which this term appears most frequently is *The Argus* (Melbourne) (873 times). By category: 1,936 are advertising, 417 are news, and 64 are detailed lists, results, or guides. By decade: In 1850-59 the term appears in the most ads or articles (481), followed by 1860-69 (360).

Note 2. It is not clear what ingredients this ketchup contains or where it was made (it was probably made in England). Ketjap / Kecap is the Malay / Indonesian word for "soy sauce." Address: [Sydney].

5. Packer (Mrs. Sarah). 1812. Recently imported. On sale, at the warehouse of Mrs. Sara Packer, Pitt-street (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* Aug. 8. p. 4.

• ***Summary:*** "... the following unexceptionable Articles, for sterling money, at very reduced Prices;... catsup 4*s.* 9*d.* per ditto" [bottle].

Note 1. This is the earliest of 3,076 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "catsup." The newspaper in which this term appears most frequently is *The Argus* (Melbourne) (1,222 times) followed by *The Mercury* (Hobart) (1,162). By category: 2,603 are advertising, 417 are news, and 56 are detailed lists, results, or guides. By decade: In 1860-69 the term appears in the most ads or articles (1,559), followed by 1880-89 (342).

Note 2. It is not clear what ingredients this catsup contains or where it was made (it was probably made in England). Ketjap / Kecap is the Malay / Indonesian word for "soy sauce."

6. Inch (Joseph). 1813. Now on sale, at the House of Joseph Inch,... for ready Sterling money (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* July 17. p. 2S.

• ***Summary:*** "... the following Articles: viz.–French Olives, Sallad Oil, Essence of Anchovies, Capers, Harvey's Meat and Fish Sauce, Walnut and Mushroom Ketchup, Beefsteak Sauce,..."

7. Bevan (Mr.). 1815. Sales by auction. At his rooms in George street (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* Sept. 23. p. 1.

• ***Summary:*** "On Wednesday of the 4th of October next, at Eleven o'Clock,...

"... Fine Cheeses, a quantity of Valentia Raisins [Valencia],... Sallad Oil [Salad], French Olives, Soy [sauce], Capers, Loaf Sugar and Irish Linen. The above may be viewed prior to the Day of Sale, and may be had by Private Contract." Address: George street [Sydney].

8. Lewis (Mr.). 1817. To be sold by auction, by Mr. Lewis, on the 17th instant, at the premises of Capt. Fergusson, the following Goods; viz.–(Ad). *Hobart Town Gazette and Southern Reporter (Tasmania, Australia).* May 10. p. 2.

• ***Summary:*** "Europe Pickles (by Gordon & Emnet). Vinegar, Mustard, & Catsup. Real China Soy [sauce]. Pepper & Sago..."

Note: This is the earliest of 283 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "China Soy." The newspaper that mentions this term most frequently is *The Mercury* (Hobart) (256 times). By category: 279 are advertising and 4 are news. By decade: In 1890-99 the term appears in the most ads or articles (207), followed by 1880-89 (51).

9. Lewis (Mr.). 1817. Sale by auction–By Mr. Lewis. The remains of the valuable Cargo, recently imported on the Brig Jupiter, from Bengal... (Ad). *Hobart Town Gazette and Southern Reporter (Tasmania, Australia).* Nov. 15. p. 2.

• ***Summary:*** "Europe Pickles (by Gordon & Emnet). Vinegar, Mustard, & Catchup. Real China Soy [sauce]. Pepper & Sago..."

10. Tawell, Apothecary, &c. 1823. Classified ad: Medicine chests completely fitted.–Physicians' and family prescriptions accurately dispensed. *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* May 29. p. 2S.

• ***Summary:*** "... mushroom and walnut ketchup; essence of anchovies, shrimp sauce, soy [sauce], Cayenne pepper, sallad oil,..." Address: No. 18, Pitt-street, Sydney.

11. James (T.H.) & Co. 1824. Sales by auction: On Wednesday next, at T.H. James & Co.'s stores, 96, George-street, at 12 o'clock... (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* Nov. 11. p. 3.
• ***Summary:*** "Britannia metal tea-sets, liquor and cruet frames,... India soy [sauce] and fish sauces, mustard, pickles, basket salt,..." Address: [Sydney].

12. Spark (A.B.). 1825. On sale, at the Stores of A.B. Spark, George-street... (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* Oct. 20. p. 1.
• ***Summary:*** "A few chests of Valetta's Hyson, Chulan, and Souchong Teas,... segars [cigars], vermicelli and soy [sauce];..." Address: George-street [Sydney].

13. Malcolm (J.). 1826. Has lately received from the first House in London, a supply of drugs, patent medicines, perfumery, pickles, &c, &c. *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* April 26. p. 4.
• ***Summary:*** "Pickles.–Walnuts, olives, fish sauce, capers in half pint and pint bottles, mushroom ketchup in ditto and ditto, Indian soy [sauce], fine anchovies,..."

Note: This is the earliest of 144 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Indian Soy." The newspaper that mentions this term most frequently is *The Brisbane Courier* (39 times). By category: 119 are advertising and 25 are news. By decade: In 1830-39 the term appears in the most ads or articles (35), followed by 1870-79 (34). Address: No. 95, Pitt-street [Sydney].

14. *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* 1827. The selector: Newspaper advertisements–Puffing (Editorial). Jan. 11. p. 4.
• ***Summary:*** This editorial begins: "It is a curious picture of the condition and habits of the country... A foreigner finds it difficult to comprehend the daily amount of actual domestic occurrences" brought to you each morning in the newspaper.

"And of all the fierce competitors for preference, in their thousand and one peculiar occupations and capacities... the improver upon India soy [sauce]..." Address: [Sydney].

15. *Hobart Town Crier (Tasmania, Australia).* 1828. Classified ad: Families in want of the following useful and valuable articles... April 19. p. 2.
• ***Summary:*** "... are most particularly invited to inspect the same, at the Royal Exchange Auction Mart, where they will be sold retail: -

"Very elegant liquor, cruet, and soy frames, plated with silver edges, and cut glass bottles,..."

16. Pitman (T.G.). 1828. On sale, No. 10, George-street,... (Ad). *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* June 23. p. 4.
• ***Summary:*** "Soy [sauce], curry powder, cider." Address: George-street [Sydney].

17. Foss (Ambrose). 1831. Chemist & Druggist (Ad). *Sydney Morning Herald (NSW, Australia).* Sept. 26. p. 2, col. 2.
• ***Summary:*** Under "Spices, &c." "Essence of anchovies. Gorgona ditto [anchovies]. India soy and all kinds of fish sauces. Chili vinegar." Address: No. 18, Pitt-street, Sydney.

18. *Sydney Gazette and New South Wales Advertiser (NSW, Australia).* 1831. Sydney general trade list. Imports. Reports from the 24th to the 31st Instant, inclusive. Nov. 1. p. 2.
• ***Summary:*** October 26.–"Elizabeth (ship), 427 tons, Phillips master, from Canton, R. Jones, agent;... 12 packages segars [cigars],... 50 packages sweetmeats, 6 jars soy [sauce], 1 box shirts,..."

19. Bentham, George. 1837. Commentationes de Leguminosarum generibus [Commentaries on the legume genera]. *Annalen der Wiener Museums der Naturgeschichte* 2:61-142. See p. 124-25. [4 ref. Lat]
• ***Summary:*** Pages 124-25, under "Leptolobium: Glycines et Kennedyae sp. Auct." contain descriptions of: "2. *Leptolobium clandestinum... Glycine clandestina* Wendl.–DC. l.c.–Australia. F. Bauer.–Van Diemens Land. Gunn n. 191.

"4. *Leptolobium tomentosum [Glycine tomentosa]*–Australia Ferd. Bauer.

"5. *Leptolobium tabacinum [G. tabacina]*–Kennedya *tabacina* Labill. *Pl. Nov. Caled. [New Caledonia] t. 70.*

On page 126 is a description of the genus "Glycine Linn.: Glycines sp. Auct.–Glycine W. et Arn. *Prod. Fl. Penins. Ind. Or.* I. 200.–Bujacia E. Mey. *Comment. Pl. Afr. Austr.* p. 127." Two species are mentioned: *Glycine Bujacia* and *Glycine Meyeri.*

Note 1. This is the 2nd earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in Australia; cultivated soybeans have not yet been reported. Note 2. Letter from Ted Hymowitz. 2004. Entry No. 5. for *Leptolobium tabacinum* is today's *Glycine tabacina.* Ted has also collected *G. tabacina* in New Caledonia. It was first reported in New Caledonia. Therefore: This is the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in New Caledonia; cultivated soybeans have not yet been reported in these islands which are part of France.

20. Australian Auction Company. 1840. Entire cargo of the "Juliet." To be sold by public auction (Ad). *Sydney Gazette*

and New South Wales Advertiser (NSW, Australia). Jan. 9. p. 3.
• ***Summary:*** "On Monday, the 13th January next,... at 11 o'clock precisely."

"The Entire Cargo of the Barque Juliet from Java consisting of–1,546 Packages superior Black Teas, 7,857 [packages] Superior quality Sugar, 221 baskets fine white ditto [Sugar], 516 Bags Table Rice, 286 Bags Coffee,...125 Casks Arrack [palm wine],... 10 Barrels and 100 cases best Cognac Brandy,... 92 Baskets Salad Oil, 6 Ditto [Baskets] Japan Soy [sauce], 189 Cases French Wines,..."

Note: This is the earliest of 3 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Japan Soy." Address: The Mart, George-street [Sydney].

21. Johnson and Moore. 1842. Ex "Clifton" (Ad). *New Zealand Gazette and Wellington Spectator (Wellington).* Feb. 23. p. 1.
• ***Summary:*** Goods for sale from the sailing ship Clifton include: "... Chili vinegar, Mushroom and Walnut Ketchup, strong vinegar for pickling, India soy [sauce], anchovy, lemon pickle,..."

Note 1. This same ad appeared in at least 8 subsequent issues of this newspaper.

Note 2. This is the earliest document seen (Dec. 2009) concerning soybean products (soy sauce) in New Zealand. This document contains the earliest date seen for soybean products in New Zealand (Feb. 1842); soybeans as such have not yet been reported.

Note 3. This is the earliest of 306 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the term "India Soy." The term was last used in New Zealand Newspapers on 24 June 1902.

Note 3. This is the earliest of 2,638 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the word "Ketchup" (regardless of capitalization). The word was last used in New Zealand Newspapers on 2 Oct. 1930.

Note 4. This is the earliest of 39 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the term "Walnut Ketchup" (regardless of capitalization). The term was last used in New Zealand Newspapers on 28 June 1906.

22. Fell (Alfred) and Co. 1842. Cargo of the Wave to be sold by auction (Ad). *Nelson Examiner and New Zealand Chronicle.* Oct. 22. p. 129, col. 1.
• ***Summary:*** Goods to be sold include: "... Nuts and raisins, India soy [sauce], olive oil, and bottled fruits, Pickles, sauces, mustard, and ketchup." Address: Trafalgar Street.

23. Fell (Alfred) and Co. 1842. Unreserved sale, for the benefit of those whom it may concern (Ad). *Nelson Examiner and New Zealand Chronicle.* Nov. 19. p. 145, col. 1.
• ***Summary:*** "... will submit for competition by public auction, on Wednesday next, the 23d instant, at their Warehouse... Three cases sauces, One case Indian Soy [sauce], Window Glass, 12 by 10.

"Terms at sale, which will commence Twelve o'clock punctually."

Note: This is the earliest of 602 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the term "Indian Soy." The term was last used in New Zealand Newspapers on 6 Dec. 1924. Address: Trafalgar Street.

24. Lyons (Samuel). 1845. Ex Kestrel from Hongkong (Ad). *Sydney Morning Herald (NSW, Australia).* April 1. p. 1.
• ***Summary:*** "Bamboo hats, crackers, silk handkerchiefs, silks, Chinese curiosities, lacquerware, preserves, soy [sauce], and camphor wood trunks."

"12 cases soy, 1 dozen each."

25. Lea and Perrins. 1846. Worcestershire Sauce testimonials (Ad). *New Zealand Journal (The)* No. 166. May 9. p. 107, col. 1.
• ***Summary:*** "Messrs. Lea and Perrins, proprietors of the Worcestershire Sauce, beg to submit the following Testimonials, as a guarantee to the public of the superior qualities of this sauce, and also to caution purchasers against worthless imitations, by observing their names are affixed to the metallic capsule which secures the cork of each bottle, to imitate which is fraud.

"The Queen's, Cheltenham, Feb. 28th, 1846. Gentlemen,–I have no hesitation in bearing testimony to the excellent qualities of your 'Worcestershire Sauce,' as the numerous families of the first rank in this kingdom, and from the Continent of Europe, and India, who honour the Queen's by their patronage enable me to speak confidently of the very general estimation in which it is held by them, and from my own experience of its merits and usefulness, I believe it to be, of its kind, quite unequalled.

"I am, Gentlemen, Your obedient servant,

"To Messrs. Lea & Perrins. S.G. Griffith.

"(Copy of a Letter from Mr. J. Cockburn.) January 10th, 1845.

"Sir,–When about to proceed to the West Indies in August last, you favoured me with a bottle of Lea and Perrins' Worcestershire Sauce, on trial; before opening which, I submitted it to the test of a four months' voyage in the Tropics, and on coming home in December, it was opened in the latitude of the Azores, and found in the highest state of preservation. On submitting it to the cook (who is a man of great experience, having been seven years in the London Tavern, and eight years at sea) he declared it to be the best sauce ever put into his hands; and I am persuaded, from the fact of its being adapted to all kinds of dishes, that Lea and Perrins' Sauce will go far to supersede the great variety of stores hitherto indispensable on board ships when employed on long voyages.

"I am, sir, your most obedient servant, James Cockburn, Acting Providore R.M.S.P. 'Thames.'

"To Mr. John Osborn, Royal Mail Steam Packet Office, Moorgate Street, London."

Note: This is the earliest ad seen (Feb. 2010) for Worcestershire Source in New Zealand or Australia. Address: [England].

26. Earle (C.V.). 1846. Ex "Thomas Lowry," "Angelina," "St. George," and other later arrivals (Ad). *Maitland Mercury & Hunter River General Advertiser (New South Wales, Australia).* Sept. 19. p. 3.
• ***Summary:*** "To be had at the Medical Chemical Repository, opposite the Angel Inn, West Maitland,

"A various assortment of Drugs and Chemicals required in the medical profession, viz.: -

"Corrosive Sublimate,... Indian Soy [sauce], and Burgess's Essence of Anchovies,..."

"Agent for Lea's celebrated Worcester Sauce, patronized by the Royal Family."

Note: This is the earliest of 3,252 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Worcester Sauce" (regardless of capitalization). The newspaper in which this term appears most frequently is *The Mercury* (Hobart) (1,091 times), followed by *The Argus* (Melbourne) (918 times). By category: 2,928 are advertising, 275 are news, and 49 are detailed lists, results, or guides. By decade: In 1860-69 the term appears in the most ads, articles, etc. (734), followed by 1880-89 (512).

27. *Colonial Times (Hobart, Tasmania, Australia).* 1846. Domestic intelligence: New sauce (Ad). Dec. 11. p. 3.
• ***Summary:*** "We are those who, with Dr. Kitchner, of 'Cook's Oracle' celebrity, lean toward good things, and who, with Apicius of old, and with Quin and other epicures of more modern times, seriously opine that the inventor of a new sauce is worthy of favourable consideration. Now, Harvey, Quin, and Burgess, have already immortalised themselves in this particular achievement, as hath, also, the anonymous compounder of the celebrated 'Reading Sauce;' but another aspirant has arisen in the clever inventor of another sauce, entitled 'Worcestershire Sauce,' which, in our epicurean opinion, eclipses all of its precursors. Of what it is compounded surpasseth our knowledge; but this we can safely affirm, that a more delicious condiment has not yet been invented for the gratification of the gustatory organs, nor one better calculated to excite an appetite in this more than warm and relaxing weather. With fish, flesh, fowl, or even 'good red herring,' it is equally good; and we can strongly recommend it to all those who, as wise men, do not despise their stomachs. We perceived by the advertisement, that Mr. Gilbert has a few cases, and perhaps other tradesmen may have a supply."

28. Gilbert (Edward). 1846. On sale at Gilbert's Grocery Store next door to the Liverpool Tea Warehouse (Ad). *Colonial Times (Hobart, Tasmania, Australia).* Dec. 12. p. 3.
• ***Summary:*** "... 50 cases pickles. A few cases Worcestershire Sauce."

This ad also appears in *The Courier* (Hobart) on 12 Dec. 1846 (p. 3) and on 16 Dec. 1846 (p. 1).

Note 1. This is the earliest of 8,918 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Worcestershire Sauce" (regardless of capitalization). The newspaper in which this term appears most frequently is *The Mercury* (Hobart) (4,395 times), followed by *The Argus* (Melbourne) (1,491 times). By category: 8,728 are advertising, 183 are news, and 6 are detailed lists, results, or guides, and 1 is family notices. By decade: In 1860-69 the term appears in the most ads, articles, etc. (3,205), followed by 1870-79 (2,949).

Note 2. Soy sauce was usually the main ingredient in Worcestershire sauce.

29. Lowes and MacMichael. 1847. Sales by auction: Chinese soy (Ad). *Colonial Times (Hobart, Tasmania, Australia).* April 2. p. 2.
• ***Summary:*** "Messrs. Lowes and MacMichael will sell by public auction, at the Exchange, on Monday next, at 12 o'clock precisely.

Five cases Chinese Soy [sauce], in the original packages, and of first-rate quality, well worthy of the attention of private families.

Note: This is the earliest of 10 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Chinese Soy." The newspaper that mentions this term most frequently is *The Courier* (Hobart) (7 times). By category: all 10 are advertising. By decade: In 1840-49 the term appears in the most ads or articles (7), followed by 1850-59 (3). Address: Liverpool Tea Warehouse.

30. *Maitland Mercury & Hunter River General Advertiser (New South Wales, Australia).* 1847. Shipping intelligence (From the Sydney Morning Herald). May 1. p. 2.
• ***Summary:*** "Imports. April 27. *Pandora,* barque, 297 tons, Captain Cobb, from China and Manila: Cargo from China–301 chests 600 half-chests and 7 cases congou tea,... 50 boxes soy [sauce]...."

Note: This cargo was for Caucasian clients.

31. Connell & Ridings. 1847. Auction sales: Will sell by auction,... (Ad). *Daily Southern Cross (Auckland, New Zealand).* Sept. 18. p. 1, col. 3.

• ***Summary:*** "... at 11 o'clock this day, at their mart, Queen-street:–... China ornaments–China vases, China matting–Chinese toys, Curry powder, Indian soy [sauce], A variety of drapery goods." Address: Queen Street.

32. Gilbert (Edward). 1847. Important notice to the public (Ad). *Colonial Times (Hobart, Tasmania, Australia).* Nov. 5. p. 1.
• ***Summary:*** "To the epicure... with the celebrated Worcester Sauce, direct to order from the house of Lea & Perrins. The piquant flavour this Sauce possesses is not to be surpassed by any."

Oct. 8, 1847. Address: Liverpool Tea Warehouse.

33. Lowes and MacMichael. 1847. Will sell by public auction, on Friday, the 26th instant, at 12 o'clock precisely, at the Exchange Rooms, Collins-street,... (Ad). *Courier (The) (Hobart, Tasmania, Australia).* Nov. 17. p. 3.
• ***Summary:*** "A splendid assortment of Chinese goods, ex 'Adelaide,' direct from Hong Kong, comprising–...

"Nests of clothes baskets, Chinese soy [sauce], Pic-nic and fruit baskets,..."

34. Hughes (Wellesley) 1848. Three hundred and six packages grocer oilman's stores, &c.,... (Ad). *New Zealander (Auckland).* May 31. p. 1, col. 4.
• ***Summary:*** "... consisting of... Chocolate pastes, Indian soy [sauce], Currie powder,..." Address: Auckland.

35. Duncan (R.J.). 1849. Ex "Lalla Rookh," Captain Haines, from London (Ad). *New Zealand Spectator and Cook's Strait Guardian (Wellington).* March 17. p. 2, col. 2.
• ***Summary:*** Goods to be sold include: "... 1 case Perfumery &c., India Soy and other Sauces, A most excellent assortment of the Best English made Blue Cloth Caps." Address: Wellington.

36. Nathan (David). 1849. Auction sales: Will sell by auction (Ad). *Daily Southern Cross (Auckland, New Zealand).* Aug. 24. p. 1, col. 2.
• ***Summary:*** "On Thursday next, August 28th, 1849, at his Rooms, Shortland-st., at 11 o'clock. 5 cases Mustards. 5 ditto [cases] Worcestershire Sauce. 1 ditto Black Draughts." Address: Shortland-st.

37. *Maitland Mercury & Hunter River General Advertiser (New South Wales, Australia).* 1850. Shipping intelligence (From the Sydney Morning Herald). April 17. p. 2.
• ***Summary:*** "Imports. April 14.–*Titania*, schooner, 140 tons, Captain Knight, from Hongkong and Manila: 5 packages silks, 40 half-chests cassia, 60 packages matting,... 30 boxes sweetmeats, 20 boxes soy [sauce], 1 package tea,... 2,400 bags sugar."

Note: This cargo was for Caucasian clients.

38. Hay & Ivey. 1850. Classified ad: The whole cargo of the Martha and Elizabeth from Canton. To dispose of by public auction,... *Courier (The) (Hobart, Tasmania, Australia).* May 22. p. 1.
• ***Summary:*** "Now landing; comprising an assortment of Teas of a very superior description, purchased in China by a gentleman of great experience expressly for this market; comprising -"

"... Four cases vegetable Macassar oil, in all its purity. Eight cases Chinese soy [sauce]. Three ditto [cases] touch paper.

Note: This is the most recent of 10 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Chinese Soy." Address: Elizabeth-street [Hobart].

39. Brigham (Mr. J.). 1850. Sales by auction: New goods. Ex "Constantinople" (Ad). *New Zealander (Auckland).* July 10. p. 2.
• ***Summary:*** "An assortment of merchandise consisting of–... Cigars, Candles, Pipes, Butter, Worcester Sauce, Blue, &c."

Note: This is the earliest of 11,690 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the term "Worcester Sauce" (regardless of capitalization). The term was last used in New Zealand Newspapers on 10 March 1931.

40. Somerville (Mark). 1850. Ex *Moa*, On sale by the undersigned (Ad). *New Zealander (Auckland).* Sept. 4. p. 1.
• ***Summary:*** Goods to be sold include: "... Ginger wine, Lemon syrup,... Ground ginger and cayenne, Caraway seeds, India soy [sauce], Mustard in ½ lb. and 1 lb. bottles, Ditto in tins,..."

41. Hughes (Wellesley). 1851. Ex "Cresswell," from London, and on sale by the undersigned, one hundred and ninety-six packages groceries,... (Ad). *New Zealander (Auckland).* March 22. p. 1, col. 4.
• ***Summary:*** "... oilman's stores, fruits, &c., &c. consisting of–... Burgess Essence Anchovies. Anchovy Paste. Mushroom Catsup. Lea and Perrin's Worcester Sauce. Brown Vinegar."

Note: Similar ads appeared in the March 23 (p. 1) and March 26 (p. 1) issues of this newspaper. Address: Auckland.

42. Hughes (Wellesley). 1851. Ex "Emma," "Maukin," and "Moa." *New Zealander (Auckland).* April 30. p. 2.
• ***Summary:*** The goods sold included: "Currie Powder, India Soy [sauce], Ling Fish,..." Address: Auckland.

43. Somerville (M.). 1851. On sale–Ex "Maukin" (Ad). *New Zealander (Auckland).* July 26. p. 1.
• ***Summary:*** "... German Matches. Worcester Sauce, (Lea and Perrin's). Castor oil, quarts, pints and half-pints."

Note: This ad also appeared in the 29 July 1851 issue of the *Daily Southern Cross* (p. 2). Address: Corner of Shortland and Queen-streets, Auckland.

44. Mueller, Ferdinand. 1852. Diagnoses et descriptiones plantarum novarum, quas in Nova Hollandia australi praecipue in regionibus interioribus. Leguminosae [Diagnoses and descriptions of new plants from eastern Australia, especially the interior regions]. *Linnaea* 25:367-445. See p. 389, 394. [Lat]
• ***Summary:*** The section titled "Leguminosae" starts on p. 389. According to Bentham (1864, p. 244-45) this document contains a description of *Glycine tabacina* on page 394, under the name *Desmodium Novo Hollandicum.* A detailed description of that plant in Latin is indeed given on that page The plant, a native of Tasmania, anthesis September, is classified under the larger category "Leguminosae."

The full name of the journal is: "Linnaea. Ein Journal für die Botanik in ihrem Umfange. (Vol. 25). Oder: Beitraege zur Pflanzenkunde (Vol. 9)."

45. Smith (James). 1854. Sale of merchandise and land (Ad). *New Zealand Spectator and Cook's Strait Guardian (Wellington).* Jan. 14. p. 2.
• ***Summary:*** "Mr. James Smith has received instructions from the Importers, to sell on Tuesday, 17th January next, without reserve, ex *Northfleet,* from London, the undermentioned desirable Merchandise, viz: -

"Bloater Paste. Worcester Sauce. Capers." Address: [Wellington, New Zealand].

46. Sharland & Co. 1854. On sale by the undersigned, ex *Joseph Fletcher* (Ad). *Taranaki Herald (New Zealand).* Oct. 11. p. 1, col. 2.
• ***Summary:*** "1 case Child's Night Lights. 1 do [ditto = case] Lea & Perrin's Worcestershire Sauce." 1 case each "Burgess' Essence Anchovies. Burgess' Reading Sauce. Burgess' India Soy [sauce]. Burgess' Mushroom Ketchup."

47. Weston (Thomas) & Co. 1854. Public auction sales, in the Estate of the late Mr. Wellesley Hughes, stock in trade of groceries, &c. (Ad). *Daily Southern Cross (Auckland, New Zealand).* Oct. 31. p. 1.
• ***Summary:*** "Thomas Weston & Co. have received instructions to sell by Auction to-morrow, 1st November, at the premises of the late Mr. Wellesley Hughes, Shortland-street, at 11 o'clock, the stock in trade of groceries, &c., comprising goods lately imported from England... Packages being unbroken.

"3 cases muscatels.

"3 cases jams 2 and 1 lb.

"1 case Worcester sauce.

"16 casks carbonate soda." Address: [Auckland, New Zealand].

48. Somerville (M.). 1855. Ex "Rock City" from London (Ad). *Daily Southern Cross (Auckland, New Zealand).* June 22. p. 2, col. 5.
• ***Summary:*** "From the celebrated Houses of Crosse & Blackwell, G.F. Coward & Batty and Company. One hundred and fifty cases fancy groceries and oilman's stores... 30 cases Chouchou, Imperial hot and mixed pickles, 6 cases Sauces & Soyer's relish, Indiana Soy [sic, Indian Soy]. China Soy, Worcester Ketchup, Harvey, John Bull, &c., in fancy vases and bottles, 20 cases Bottled vinegar, pints, quarts, and fancy decanters,..."

Note 1. This is the earliest of 177 documents seen (Nov. 2009) in the New Zealand Newspapers database (paperspast) that contains the term "China Soy." The term was last used in New Zealand Newspapers on 23 April 1906.

Note 2. The meaning of "Worcester Ketchup" is unclear. The text should probably read "Worcester [sauce], Ketchup,..." Address: Auckland.

49. *Daily Southern Cross (Auckland, New Zealand).* 1855. China and the Chinese. July 17. p. 2 (Supplement).
• ***Summary:*** A very interesting lecture was recently delivered at the School of Arts, Sydney [Australia], by Dr. J. Berncastle, on the subject of "China and the Chinese."

"The soy [sauce], which it had been said was made from cockroaches, was made from a pea which was allowed to ferment with salt."

50. Cohen and Harbottle. 1855. Have received instructions from Mr. Thomas Taylor to sell by auction (Ad). *Sydney Morning Herald (NSW, Australia).* July 25. p. 6.
• ***Summary:*** "... at his Stores, 184 George-street, on Tuesday, 31st July, 1855, at half-past 10 o'clock precisely...

"Oilmen's stores and groceries... Herrings in tins. India soy [sauce],..."

51. Morrin (W.). 1855. For sale at W. Morrin's grocery, wine & spirit establishment,... (Ad) *Daily Southern Cross (Auckland, New Zealand).* Oct. 19. p. 2, col. 3.
• ***Summary:*** "... Mustard, vinegar, table salt, Assorted sauces, Chinese soy [sauce], & capers, Maccaroni [Macaroni], Vermicilli [Vermicelli], Isinglass, & gelatine,..." Address: Queen-street.

52. Mueller, Ferdinand. 1856. Definitions of rare and hitherto undescribed Australian plants, chiefly collected within the boundaries of the Colony of Victoria. *Hooker's J.*

of Botany and Kew Garden Miscellany 8:33-46. See p. 41, 45.

• ***Summary:*** According to Bentham (1864, p. 245), this document contains a description of *Glycine sericea* on page 45, under the name *Leptocyamus sericeus.* A detailed description of that plant in Latin is indeed given on that page under "Leguminosae" (see p. 41). Address: Government Botanist for the Colony of Victoria.

53. Towns (B.) and Co. 1858. The undersigned offer for sale, the following Chinese goods... (Ad) *Argus (The) (Melbourne, Victoria, Australia).* April 24. p. 2.

• ***Summary:*** "... now landing, ex Panama, from Hong Kong,

"Kum chum, vermicelli, soo lew. Beanstick [probably dried yuba], or maccaroni [macaroni], red dates, peas.

"Pearl barley, honied dates, green ginger. Chinese oil in jars; salted vegetables.

"Salted turnips (pieces), white beans curd [tofu].

"Pickle beans curd [pickled tofu; fermented tofu?], green peas."

This ad also appears in the April 26 issue (p. 3).

Note 1. This is the earliest document seen (March 2010) stating that beanstick (probably dried tofu), white beans curd (tofu), or pickled beans curd (probably fermented tofu) are now in Australia.

Note 2. In 1851 gold was discovered in Victoria, in southeast Australia. A huge gold rush followed that lasted until the late 1860s. In 10 years from 1851 to 1861 Australia's population nearly tripled. As was the case with the California gold rush two years earlier (1849+) large numbers of Chinese joined the stampede. These three Chinese soyfood products were clearly imported for the Chinese.

Note 3. This is the earliest English-language document seen (March 2010) that uses the word "Beanstick" (or "Beansticks") to refer to what is probably dried yuba rolls. Address: 26 William-Street [Melbourne].

54. Lea and Perrins. 1858. Celebrated Worcester Sauce (Ad). *Age (The) (Melbourne, Australia).* April 27. p. 3, col. 2.

• ***Summary:*** "Pronounced by connoisseurs to be the Only Good Sauce, and applicable to every variety of dish.

"Extract of a letter from a medical gentleman at Madras [India], to his brother at Worcester, May, 1851. 'Tell Lea & Perrins that their Sauce is highly esteemed in India, and is, in my opinion, the most palatable as well as the most wholesome sauce that is made.'

"Extensive frauds. Lea and Perrins have discovered that several of the Foreign Markets have been supplied with spurious imitations of their 'Worcestershire Sauce,' the labels of which closely resemble those of the Genuine Sauce, and in one or more instances with the names of L. and P. forged; they have deemed it their duty to caution the public, and request purchasers to see that the name Lea & Perrins are upon the Wrapper, Label, Stopper, and Bottle.

"L. & P. further give notice, that they will proceed against any one who may infringe upon their right, either by manufacturing or vending such imitations, and have instructed their correspondents in the various parts of the world, to advise them of such infringements.

"Wholesale and for Exportation by the proprietors Lea and Perrins, Worcester, England; Crosse and Blackwell, and other Oilmen and Merchants, London.

Note: This is the earliest document seen (March 2010) that contains the words "Extensive frauds" or the words "spurious imitations" in connection with Worcestershire sauce. Address: [Worcester, England].

55. *Courier (The) (Hobart, Tasmania, Australia).* 1859. Agricultural and scientific inquiries: East Indian pulses (Letter to the editor). April 11. p. 2.

• ***Summary:*** "M.J. No doubt many valuable vegetable substances, which are grown in and used by the... countries of the Southern Hemisphere, might either be successfully cultivated here or profitably imported."

"The most important of these pulses appears to be the soja hispida, or bhoot, which contains a very large amount of nitrogen, phosphorous, sulphur, and iron."

Note: This is the earliest document seen (March 2010) concerning soybeans (soja hispida) in connection with (but not yet in) Australia, or Oceania.

56. Bentham, George. 1860. The flora of Tasmania. Gen. XVIII. Leptocyamus, Benth. In: Joseph D. Hooker. The Botany of the Antarctic Voyage of H.M. Discovery Ships *Erebus* and *Terror,* in the Years 1839-1843. Flora Tasmaniae. Part III. Flora Tasmaniæ. Vol. I. Dicotyledones. London: Lovell Reeve. See p. 102. t. 17. [Eng; lat]

• ***Summary:*** Contains descriptions in Latin and English of: (1) This genus, which is a genus of Australian plants closely allied to *Glycine* (a large tropical genus), of which about eight species are known, mainly natives of the east coast. (2) *Leptocyamus Tasmanicus* (Benth.), which is distributed in south-eastern Australia. The author has seen only specimen of this plant. "It is very nearly allied to *Leptocyamus Latrobeanus* (Zychia, Müller)." Note 1. This species was later renamed *Glycine latrobeana.*

(3) *Leptocyamus clandestinus* (Benth). "Var. a. *clandestina... Glycine clandestina (Wendl.).*" Note 2. The species *Leptocyamus clandestinus* was later officially renamed *Glycine clandestina.*

57. Somerville (M.). 1861. Ex "Bosworth," from London. For sale at the city mart,... (Ad) *Daily Southern Cross (Auckland, New Zealand).* March 13. p. 1.

• ***Summary:*** Items from Crosse & Blackwell being sold include "4 cases Lea and Perrin's Sauce" [Worcestershire]. Address: Auckland.

58. Sutton (F.). 1861. F. Sutton begs respectfully to inform his friends... he has greatly enlarged his premises and stock, which now comprises: (Ad) *Hawke's Bay Herald (New Zealand).* July 6. p. 5.
• ***Summary:*** Items being sold include "Lea and Perrin's Sauce" [Worcestershire]. "Crosse and Blackwell's Sauce, assorted."

Note: A similar ad appeared in this newspaper on July 13, 20, 27, Aug. 6, 13, 20, 27, and Sept. 3. Address: Napier.

59. *Argus (The) (Melbourne, Victoria, Australia).* 1861. Commercial intelligence: Of the tonnage in China waters,... July 13. p. 4.
• ***Summary:*** "... we find the following notice in the *China Overland Trade Report* of the 27th of May: -

"Shanghae.–... The arrival of a large number of junks from Shantung with peas and [soy] beans having caused a considerable fall in the market value of these articles,... "To Swatow the inquiry has temporarily slackened, the season for shipment of bean cake to that port for the early sugar crop being now over.

Note: This is an early mention of soybeans in an Australian newspaper.

60. Bentham, George; Hooker, Joseph Dalton. 1862-1867. Genera plantarum: Ad exemplaria imprimis in Herbariis Kewensibus servata definata. Voluminis primi [Genera of plants: Defined according to the model first documented in the Kew herbaria. Vol. 1]. London: Lovell Reeve & Co. xii + 1040 p. See p. 530. Index. 25 cm. Facsimile edition reprinted in 1965 by Verlag von J. Cramer (Weinheim, Germany) with an introduction by William T. Stearn. [Lat]
• ***Summary:*** In the chapter on Leguminosae, under the Phaseoleæ tribe, section 196 concerns the genus Glycine. Writing entirely in Latin, the authors discuss the characteristics of the genus and note that 12 species grow in Africa, Asia, and Australia. These include *Glycine javanica, G. labiali, G. soja, G. leptolobium, and G. bujacia.* The section on the soybean reads: "Soja, Savi, Mem. Phas. ii. 16; DC. [de Candolle] Prod. ii. 396, charactures omnes *Glycinis* exhibet, nisi legumen latum falcatum; formae tamen intermediae occurrunt in speciebus tam Mascarensibus quam Australiensibus.–*Jacq. Ic. Rar. t. 145 (Dolichos).*"

Note 1. This is the earliest document seen concerning soybeans (but only wild perennial relatives of soybeans, *[Glycine soja])* in Australia; cultivated soybeans have not yet been reported. Note 2. Bentham lived 1800-1884. Hooker lived 1817-1911.

Note 2. Also discusses the following genera: *Lupinus* (lupins, p. 480). *Arachis* (peanuts, p. 518). *Teramnus* (Glycine, p. 530). *Pueraria* (kudzu, p. 537). *Phaseolus* (common beans, p. 538). *Vigna* (p. 539). *Voandzeia* (p. 539-40; Thouars, *Gen. Nov. Madag.* 23). *Psophocarpus* (winged bean, p. 540). *Dolichos* (p. 540-41).

61. *Argus (The) (Melbourne, Victoria, Australia).* 1864. D'Artagnan, for Sydney. Aug. 8. p. 4.
• ***Summary:*** "73 bags rice, 10 boxes tea,... 3 boxes opium, 24 boxes 20 baskets ginger, 100 jars soy [sauce],... 49 baskets pickles, 5 boxes bean sticks [dried yuba],..."

Note: These Chinese foods were probably imported for the Chinese who had joined the Victoria gold rush, which lasted until the late 1860s.

62. Bentham, George; Mueller, Ferdinand. 1864. Flora Australiensis: A description of the plants of the Australian Territory. Vol. II. London: Lovell Reeve & Co. 521 p. See p. 242-45. [5 ref. Eng]
• ***Summary:*** The authors made the first major additions to the genus Glycine, all from Australia. They include only the following 6 species in the genus Glycine: (1) *Glycine falcata,* Benth. Found in Northern Australia by F. Mueller; in Queensland by D'Orsay, and in South Australia by Bowman, and Neilson.

(2) *G. clandestina,* Wendl. Bot. Beob. 54. [Wendland, J.C. 1798. *Botanische Beobachtungen...* p. 54] Found in Queensland by Robert Brown, and Dr. Leichhardt; in New South Wales by R. Brown, C. Stuart, Dr. H. Beckler, and F. Mueller; in Victoria by R. Brown, Adamson, and F. Mueller; in Tasmania by R. Brown, and J.D. Hooker; in South Australia by Dr. H. Behr, and F. Mueller; in Western Australia by Maxwell, and James Drummond.

(3) *G. latrobeana,* Benth.; G. tabacina, Benth. Found in Victoria by Latrobe, Adamson, and F. Mueller; in Tasmania by J.D. Hooker; in South Australia by F. Mueller.

(4) *G. tabacina* Benth. Found in Queensland (at Bustard Bay) by Banks and Solander; in New South Wales by R. Brown, A. Cunningham, C. Stuart, and Beckler; in Victoria by Robertson, and F. Mueller; in South Australia by F. Mueller; in Western Australia by Mr. Augustus Oldfield. "The species is also in New Caledonia, the Feejee [Fiji], and other islands of the South Pacific.

(5) *G. sericea,* Benth. Found in New South Wales by J. Dallachy, and Wheeler; in Victoria by F. Mueller.

(6) *G. tomentosa,* Benth. Found in Northern Australia by F. Mueller, and R. Brown; in Queensland by Banks and Solander, R. Brown, McGillivray, and F. Mueller; in New South Wales by Neilson. "We have the same species from the Philippine Islands and from S. China."

Note 1. Hermann (1962) states: "It was not until 1864 that the first major addition to the genus was made. This was by Bentham, who treated the genus in Australia as comprising six species, all of them still valid although two of his names (*Glycine sericea* and *G. tomentosa)* must be dropped as being later homonyms... Bentham's *Glycine falcata* of 1864 was the last of the true *Glycine* species to be described."

Note 2. This is the 2nd earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in Fiji; cultivated soybeans have not yet been reported in this country.

Note 3. This is volume 2 of a 4-volume set, which contains no formal bibliography. Most of the citations refer to herbarium collections, which are described by Bentham in the preface to volume 1 (1863). The chief foundation of this work is "the vast herbarium of Sir William J. Hooker, with a few smaller collections under his charge at Kew." It contains rich stores of Australian plants. The Australian herbarium of the late Robert Brown is an "extraordinary collection, the main foundation of our knowledge of Australian vegetation." These specimens are now the property of Mr. J.J. Bennett, Head of the Botanical Department of the British Museum. The Banksian herbarium collected by Banks and Solander [who sailed with captain James Cook] about 90 years ago, is also at the Botanical Department of the British Museum. Rich herbaria were collected at the public expense by the late A. Cunningham in his various expeditions. This collection is "second only to R. Brown's in the influence it has had, by its variety and extent, on our knowledge of Australian botany." Address: 1. F.R.S., P.L.S.; 2. M.D., F.R.S., L.S., Government botanist, Melbourne, Victoria, Australia.

63. Graham (Messrs. D.) and Co. 1866. 600 packages of groceries, oil-men's stores, wines and spirits,... (Ad) *Daily Southern Cross (Auckland, New Zealand).* July 28. p. 2.
• ***Summary:*** "... 3 cases Mushroom Catsup, 2 cases Indian Soy [sauce], 1 case French Olives,..." Address: Vulcan-lane.

64. Lindley, John; Moore, Thomas. eds. 1866. The treasury of botany: A popular dictionary of the vegetable kingdom; with which is incorporated a glossary of botanical terms. 2 vols. (Parts I and II). London: Longmans, Green, and Co. xx + 1254 p. See Part I. p. 131, 536-37, 747. Part II. p. 1068, 1075. Illust. 17 cm.
• ***Summary:*** Bean (Part I, p. 131) "Sahuca bean, *Soja hispida.*

Glycine (Part I, p. 536-37) "A small genus of *Leguminosae,* all, excepting one, being slender decumbent [reclining along the ground, but with ascending apex or extremity] or twining herbs, with alternate stalked leaves made up of three to seven leaflets varying much in form, and bearing axillary racemes or fascicles of small yellow or violet pea-flowers. The genus belongs to the tribe *Phaseoleae,* and is most nearly allied to *Teramnus,* from which it is distinguished by its pods being destitute of the hardened hooked style seen in the latter, and by the ten stamens, which are united into a tube, being all, instead of the alternate ones only, anther-bearing. The species are pretty equally distributed through tropical Asia, Africa, and Australia, where a few inhabit extratropical regions.

"The Sooja of the Japanese, *G. Soja,* the only erect species of the genus, a dwarf annual hairy plant, a good deal like the common dwarf kidney or French bean *(Phaseolus vulgaris),* has small violet or yellow flowers, borne in short axillary racemes, and succeeded by oblong two to five-seeded hairy pods.

"The seeds, like kidney beans in form but smaller, are called Miso [sic, error based on Miller 1807] by the Japanese and are made into a sauce which they call Sooja or Soy. The manner of making it is said to be by boiling the beans with equal quantities of barley or wheat, and leaving it for three months to ferment, after which salt and water is added, and the liquid strained. The sauce is used by them in many of their dishes, and they use the beans in soups. The Chinese cook the beans also in various ways, and the plant is cultivated for the sake of them in various parts of India and its Archipelago.

"Mr. Bentham groups the species in three sections, which some regard as genera: *Soja,* with flowers fascicled on the racemes, and falcate pods with depressions but not transverse lines between the seeds; *Johnia,* with flowers similarly arranged, and straight pods with transverse lines between the seeds; and *Leptocyanus,* with solitary flowers on the racemes, and straight pods. The Glycine or *Wistaria* of gardens is now referred to *Millettia.*

Miso (Part II, p. 747). "A fatty substance obtained from *Soja hispida.*

Soja (or Soya) hispida (Part II, p. 1068) is the only representative of a genus of *Leguminosae* of the tribe *Papilionaceae,* and much cultivated in tropical Asia on account of its beans, which are used for preparing a well-known brown and slightly salt sauce (Soy), used both in Asia and Europe for flavouring certain dishes, especially beef, and supposed to favour digestion. Of late it has been cultivated as an oil-plant. S. hispida is an erect hairy herb, with trifoliate leaves, and axillary racemose flowers, which have a five-cleft calyx, a papilionaceous corolla, ten diadelphous stamens, and an oblong pod which contains from two to five ovate compressed seeds. Modern botanists generally refer the plant to Glycine: which see."

Soy (Part II, p. 1075) "A sauce originally prepared in the East, and said to be produced from the beans of *Soja hispida.*

Note 1. This is the earliest document seen (April 2003) in which the soybean is classified under *Papilionaceae.*

Note 2. This is the earliest English-language document seen (April 2003) that uses the term "oil-plant" to describe the soybean.

Also discusses (in alphabetical order): Agar-agar. Alfalfa. Algæ. Almond. Amande de terre (French, *Cyperus esculentus).* Amaranthus. Arachis [peanuts]. Aspergillus. Bean, under-ground kidney = *Arachis hypogaea.* Cannabis. Chenopodium [Common Goosefoot]. Coix [lachryma, Job's tears]. Cyperus. Earth-nut *(Arachis hypogæa).* Flax. Gingelly oil. Hemp.

Part II: Job's tears. Legume. Leguminosæ. Linseed. Linum. Lupinus (incl. *Lupinus albus, L. luteus).* Nut, bambarra ground (The seed of *Voandzeia subterranea,* p. 795). Nut, earth *(Arachis hypogæa).* Oil (incl. sesamum). Oilcake ("The residuum after expressing the oil of various seeds, especially linseed and rape, which is used for cattle feeding, and as a manure"). Oil-plant *(Sesamum orientale).* Pindals, pindars. Psophocarpus. Pueraria. Quinoa *(Chenopodium Quinoa).* Sea-girdles *(Laminaria digitata).* Sea-hangers. Sea-wand *(Laminaria digitata).* Seaware. Seaweeds. Seawrack. Seawracks. Sesame. Sesamum. Tetragonolobus.

"Voandzeia. So called from Voandzou, the name given by the natives of Madagascar to the only known representative of this genus of *Leguminosæ,* the *V. subterranea* of botanists, a creeping annual, with long-stalked leaves composed of three leaflets... It is a native of Africa, and is extensively cultivated in many parts of that continent, from Bambarra and the coast of Guinea to Natal [in today's South Africa], its esculent pods and seeds forming common articles of food among the inhabitants of those regions. Although the plant is not indigenous to the Western Hemisphere, it is commonly found in many parts of South America, such as Brazil and Surinam, whither it has been carried by the negro slaves and has now become naturalised. The pods are sometimes called Bambarra Ground-nuts; in Natal the natives call them Igiuhiuba; while in Brazil they are known by the name of Mandubi d'Angola (showing their African origin), and in Surinam by that of Gobbe.

"Voandzou. The Malagassy name of a genus of *Leguminosae,* called after it *Voandzeia"* (p. 1224).

Note 3. This is the earliest English-language document seen (Nov. 2005) that contains the word "oilcake" (or "oilcakes"). Address: 1. Ph.D., F.R.S., F.L.S., Botanic Garden, Chelsea. Late emeritus Prof. of Botany in University College, London; 2. F.L.S., Curator of the Chelsea Botanic Garden.

65. *Brisbane Courier (Queensland, Australia).*1868. Sauces. Jan. 11. p. 7.

• ***Summary:*** "India Soy [sauce] is difficult to purchase genuine; it should be made from an Indian plant called Dolichos soja, or soya, but treacle and salt are the basis of the Soy ordinarily sold. 'Many persons,' observes Mr. Dobell, in his *Travels in China,* 'have thought that gravy was used in preparing soy, but this appears not to be the case, but the composition being entirely a vegetable one, and made from beans. Japanese soy is much esteemed in China, probably it is made with a particular bean? In China the consumption of soy is enormous; neither rich nor poor can dine, breakfast, or sup without soy; it is the sauce for all sorts of food, and may be described as indispensable at a Chinese repast.'"

Note: This is the earliest of 2 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "Japanese soy."

66. Sakuma, Yonekichi. 1868. Nikki [Diary]. April 25. Unpublished. [Jap]*

• ***Summary:*** In the first year of Meiji (1868) the author was a passenger on the ship "Scioto" *(Saioto-go),* headed for Hawaii with the first group of Japanese immigrants. He noted in his diary of April 25: "Yokohama departure. Provisions of rice, miso, shoyu."

Note: This is the earliest document seen (June 2008) concerning soybean products (miso and shoyu) in Hawaii. This document contains the earliest date seen for soybean products in Hawaii (April or May 1868); soybeans as such had not yet been reported by that date.

Letter from Mr. Nihei. 1988. Oct. 23. Yonekichi SAKUMA, born on 11 July 1840, came from Chiba prefecture. He went to Hawaii as an immigrant in 1868, and died in 1927 at age 88.

Letter from Paul J. O'Pecko, Reference Librarian, Mystic Seaport Museum, Mystic, Connecticut. 1990. July 3. There were at least two three-masted sailing vessels named Scioto sailing in 1868, but there is no indication that any vessel named Scioto was ever owned by the Pacific Mail Steamship Company. It is possible they may have chartered it.

67. *Argus (The) (Melbourne, Victoria, Australia).*1870. Tuesday, December 13, 1870. Dec. 13. p. 4-5. See p. 5.

• ***Summary:*** In Melbourne: "Three other cases before the District Court yesterday... Some time was occupied in hearing a couple of cases in which the defendants were charged with selling spurious Worcestershire sauce, bearing an imitation of the label of Lea and Perrins, the well-known manufacturers. James Dunlea and James Nicholson, of 107 Elizabeth-street, and Thomas and Richard Fogarty, of Queensberry-street, Hotham, were charged, on the information of Wm. R. Virgoe, jun. [agent for Lea and Perrins], with having on the 20th November last sold certain bottles containing, an article called Worcestershire sauce, together with a forged or counterfeited trade-mark, knowing the same to be the forged or counterfeited trade-mark of Lea and Perrins, used by them in an article known as Worcestershire sauce.

"The evidence showed that the bottle sold by Dunlea and Nicholson was labelled in very close imitation of the genuine, the words 'equal to' being inserted unpretendingly in much the same manner as *à la* was used for Wild's Carlisle ale, but that sold by the Fogarty's shopman was not a close imitation, and in fact the imitation seemed to consist in calling the contents 'Worcestershire sauce.' The defence was that there was no proof of a guilty knowledge on the part of the defendants. After hearing the evidence, the Bench said they did not feel disposed to impose a penalty in these cases. On the one hand, no person who viewed the bottles could come to any reasonable conclusion other than that they were a gross and scandalous imitation; but, on the other hand, the evidence did not show that the defendants had been knowingly aiding and abetting and gaining by the fraud. If any further sales took place the case could be very easily presented to the Bench again with a knowledge of the fraud on the part of the defendants. The facts were beyond dispute, but the great difficulty was in bringing home to the defendants that they had acted with a knowledge of and had profited by the fraud. The cases were, therefore, dismissed."

Note: An article titled "Trade-mark prosecutions," describing a different case related to Lea and Perrins' Worcestershire sauce, appeared 3 days later in this newspaper on Dec. 16 (p. 7).

68. *Taranaki Herald (New Zealand).* 1874. The gathering of fungus... March 7. p. 2.
• ***Summary:*** "... has of late years become an important industry in this Province. The fact of fungus being of any value was made known here by Mr. Chew Chong offering to purchase any quantity that might be brought to him; and many inquiries were then instituted as to what use was made of it in China." During one year as much as 65,250 lbs. was exported. The Commissioner of Customs has written to the Colonial Secretary at Hongkong respecting its value and use. The Secretary replied:

"'Regarding the accompanying specimen of a kind of fungus on which you desire a report, I have the honor to inform you that this fungus is much prized by the Chinese community, as a medicine administered in the shape of a decoction to purify the blood. It is also used on fast days. A mixture of vermicelli, bean curd [tofu], and this fungus, is boiled and eaten instead of animal food."

Note: This article also appeared under the title "Exportation of fungus" in the *Southland Times* (March 11, p. 2), however the word "bean curd" was spelled "beancurds."

It also appeared under the title "Local and general news" in the *Wanganui Chronicle* (March 17, p. 2), however the word "bean curd" was spelled "beancurd."

69. *North Otago Times (New Zealand).* 1878. New Zealand State Forests. March 22. p. 2 (Supplement).
• ***Summary:*** From the *Gardeners' Chronicle* (29 Dec. 1877)–the following "Report of the Conservation of State Forests, Wellington, 1877."

"... but the most curious article of exportation as a Fungus, *Hirneola polytricha,* of which we are told that in 1871 this plant was first collected for exportation to China, where it is used as an article of food, being boiled and mixed with bean curd [tofu] and vermicelli; it is also administered as a medicine to purify the blood. Its price in Hong Kong is 10½*d* per pound retail."

70. *Brisbane Courier (Queensland, Australia).* 1879. Queensland trade with Japan. April 30. p. 3.
• ***Summary:*** "The following letter was addressed to Mr. Wildash previous to his departure from Japan: 'Interior Department, Tokio, Japan, January 25, 1879. Sir, I have the honor to request you to hand to the Government of Queensland two maps of Japan, also a small assortment of agricultural seeds to the National Agricultural and Industrial Association of that colony, as exchanges for those conveyed through you to the Government of Japan from Queensland. I have also great pleasure in forwarding you various samples of our national productions for the purpose of distribution in your colony, and with a view of fostering a commercial intercourse between the two countries.–I have the honor to be your obedient servant, Ito Hirobumi, Minister of the Interior Department.'

"The following is the list of agricultural seeds received from Japanese Minister of Interior, and referred to in Mr. Wildash's letter:–Barley, wheat, rye, millet (Oplysmenus frumentaceus), millet (Panicum miliaceum), bean (black Soja), bean (Soja Glycine), pea (Pisum sativum), pea (white), Indian corn."

Note 1. This is the earliest document seen (March 2010) concerning soybeans (not including wild perennial relatives of the soybean) in Australia or Oceania. This document contains the earliest clear date seen (April 1879) for soybeans in Australia or Oceania.

71. *Brisbane Courier (Queensland, Australia).* 1879. Monday, May 19, 1879. May 19. p. 2.
• ***Summary:*** "The agricultural seeds forwarded to the National Association by the Japanese Minister of the Interior, per Mr. Wildash, are now available for distribution to farmers and others desirous of proving their characteristics and value. The seeds comprise barley, wheat, rye, maize, millet (two kinds), soja bean (two kinds), pea (two kinds), all of which have been raised in different districts of Japan. The secretary will be happy to forward small trial quantities on application."

Note: These may be the first soya beans available for cultivation in Australia. They came from Japan. They were almost certainly cultivated in mid-1879 in Queensland, but we cannot be 100% sure.

72. *Sydney Mail (Australia).* 1879. Household: Dainty dishes. Oct. 11. p. 596.
• ***Summary:*** "Sauce au diable.–Mix well together the following ingredients: 1 oz. of cayenne, 1 oz. of pounded sugar candy, 6 anchovies, 6 cloves, and 6 small eschalots all pounded, one quart of vinegar, 1½ gill of soy, 1½ gill of mushroom ketchup. Shake often; in ten days it is fit for use. Let it stand for two or three days to get clear, then bottle for use."

73. Warington, Robert. 1879. Agricultural chemistry in Japan. *Chemical News (The)* 40(1039):195-96. Oct. 24.
• ***Summary:*** "In the International Exhibition, now being held at Sydney [Australia], a collection of soils, manures, and agricultural products is shown by the Imperial College of Agriculture in Tokio, Japan. Accompanying the collection is a descriptive catalogue, compiled by Mr. Kinch, the Professor of Chemistry at the College, in which a short account is given of the various products exhibited, with chemical analyses of the majority of them. The catalogue contains in all about 80 analyses of Japanese products. The whole of this important work has been accomplished in the laboratory of the College, under the superintendence of Mr. Kinch, and is certainly highly creditable to the Institution."

The section titled "Soy Bean *(Glycine [Soja] hispida)*" (p. 195) mentions miso, tofu, and shoyu. Address: M.R.C.S. Eng.

74. Kinch, Edward. 1879. Japan: A classified and descriptive catalogue of a collection of agricultural products exhibited in the Sydney international exhibition by the Imperial College of Agriculture, Tokio, Japan. Tokyo: Agricultural Bureau (Naimushô), Home Dept. 65 p. 20 cm. [Eng]
• ***Summary:*** Each item that was displayed is numbered. All chemical / nutritional analyses give percentage composition unless otherwise stated. The chapter on "Manures "begins (p. 4): "The principal manures used in this country are human excrements both solid and liquid, which are collected with the greatest care and applies to the land whilst in a more or less advanced state of decomposition. The excreta are often made into a compost with dried grass.

The section titled "vegetable manures" (p. 7-13) gives analyses of rape cake *(abura kasu)*, malt dust *(ame kasu)*, sesamum cake *(goma kasu)*, rice beer residues *(sake kasu)*, soy [sauce] residues *(shoyu kasu;* water 16.37%, ash 4.96%, organic matter 78.67%), rice cleanings *(nuka)*, and barley bran *(fusuma)*.

The chapter on "Foods" begins (p. 16): "By far the most important national food is rice, *Kome;* more than one half of the cultivated land of the Empire is devoted to paddy fields, *Ta*, and besides the rice grown on this irrigated land a considerable quantity is grown on the dry fields, *Katake*." *Mochi-gome* or glutinous rice, is specially used for making the new years' cakes, *Mochi*.

The many kinds of leguminous plants include: Peas, field and haricot beans, vetches, lupins; soy beans *Glycine (soja) hispida, O-mame or Daidzu;* fol. lanceolata *(Midzu-kugiri); Phaseolus radiatus, Adzuki* or *Shodzu; P. radiatus v. pendula, Tsura-adzuki; P. radiatus subtriloba, Bundo;* Horse gram, *Dolichos uniflorus, Sasagi;* Gram, *Dolichos umbellatus, Hata-sasagi;* Overlook pea, *Canavalia incurva, Nata-mame;* Ground nut, *Arachis hypogæa, Rakkasho* or *Tojin-mame.*

"Also should be mentioned the sesamum, *Goma*, the oil of which is extensively used in cooking; *Perilla ocymoides, Ye-goma;* and rape, *Brassica sinensis, Abura-na,* which is cultivated for its seed, the oil being used for burning." Also list (with scientific and Japanese names, p. 17-18) the principal root crops, fruits, sea weed and lichens, fungi, and starch.

Next: Chemical analyses of rice, wheat, rye, "red bean–*Adzuki–Phaseolus radiatus* (large variety and small variety)."

Note 1. This is the earliest English-language document seen (March 2006) that uses the word *Shodzu* (or *shôdzu* or *shôzu* or *shodzu* or *shozu)* or the word "red" or the term "red bean" to refer to the azuki bean, or that gives its scientific name as *Phaseolus radiatus*, or that reports the existence of large and small varieties, or that uses the word *Bundo* to refer to a variety of azuki bean.

Then (p. 22-26): "44. Beans. *O-mame, Daidzu. Glycine (soja) hispida.* White round soy bean. Miso mame. Percentage composition (table): Water 11.32, albuminoids 37.75, fat 20.89, fibre 1.50, ash 3.86, starch and soluble cellulose 24.58. Total 100.00.

"This bean is met with in several varieties of different colour and size, but they differ little in composition. It is vegetable which approaches nearest in chemical composition to animal food (meat), containing as it does one fifth of its weight of fat and often two-fifths of nitrogenous matter. It is an extremely valuable adjunct to the food of a people who subsist so largely on a purely vegetable diet, of which the bulk is rice so rich in heat producers–starch, and poor in flesh formers–albuminoids.

"*Shoyu, Miso,* and *Tofu*, are made from these beans, and enter largely into the food of the nation.

"45. Miso. *Shiro-miso* or white miso. From Osaka. Percentage composition: Water 50.73, fibre 12.93, ash 6.58 (containing 5.4 per cent of common salt), sugar 17.54, albuminoids 5.64, soluble carbohydrates 6.58. Total 100.00. Soluble in water 35.88 per cent.

"46. Miso. *Aka-miso* or red miso. From Osaka. Percentage composition: Water 50.40, fibre 8.25, ash 12.50 (containing 12 per cent of common salt), sugar 0.61, albuminoids 10.08, soluble carbohydrates 18.16. Total 100.00. Soluble in water 34.71 per cent."

Note 2. This is the earliest English-language document seen (March 2009) that uses the term term "Shiro-miso" refer to white miso (and vice versa) or "aka-miso" to refer to red miso (and vice versa).

"In the preparation of *Miso* the beans are boiled, pounded in a mortar into a paste and mixed with fermenting rice, *Koji* (see sake) in various proportions, and with more or less salt, and the mixture is placed in tubs and left in a cool place for about a month. It will be seen that one variety, white miso, contains much sugar, derived from the *koji*, and little salt; whilst the other variety contains very little sugar and much more salt.

"47. Tofu. Percentage composition: Water 89.29, ash 0.48, fibre 1.01, nitrogenous substances 4.87, non-nitrogenous substances 4.35 (containing 3.32% fat). Total 100.00.

"This food is made by boiling the white soy beans, *Shiro-mame*, in water after they have been soaked, ground and strained through a sieve. The solution is filtered through cotton cloth and the residue pressed; the liquid, containing legumin in solution, is precipitated by the addition of the brine which runs off from sea salt during its deliquescence in the air. The precipitate constitutes *Tofu*."

Note 3. This is the earliest English-language document seen (Oct. 2008) that uses the word "legumin" to refer to the water soluble protein in soybeans than can be precipitated by a coagulant to make tofu.

"48. Kori tofu. Percentage composition: Water 18.75, ash 1.60, nitrogenous substances 48.80, non-nitrogenous substances, chiefly fat 30.85. Total 100.00.

"Prepared from the above [tofu] by exposing it to the air during frost, until it freezes, and afterwards thawing in the sun, by which the greater quantity of the water is removed.

"49. Soy [sauce]. Shoyu. Specific gravity 1.1996. Grams per litre: Total solid residue 359.888, ash 195.168 (principally common salt), sugar 31.034, albuminoids 41.000, free acid expressed as acetic acid 6.200.

Note 4. This is the earliest document seen (Jan. 2008) that uses the term "specific gravity" in connection with soyfoods–in this case soy sauce.

"Manufacture of *Shoyu*. *Shoyu* is made from the soy bean, *Glycine (soja) hispida q.v.* together with wheat, salt and water. Equal parts of beans and wheat are used. A small part of the wheat is mixed with *Koji* (see sake) and allowed to ferment. The remainder is roasted and the beans are also roasted. The roasted beans and wheat are then mixed together with the fermenting wheat, placed in shallow wooden boxes, and kept for some days, at a fixed temperature, in a warm chamber with thick walls, until the whole mass is covered with fungus. It is very important that the temperature of this chamber should be kept at the proper point. By these processes, part of the starch of the wheat is converted into dextrin and sugar, and lactic acid and acetic acid are formed. It is then mixed with salt lye, the proportion used being about 4 *go* of salt to 12 *koku* of water to extract 1 *koku* of the fermented product. The mashings are removed to large vats and there kept for at least 20 months and generally for 3 or 5 years. The better qualities of *shoyu* are kept the longer times. It is found that the best soy is produced by mixing that kept for 5 years with that kept for 3 years. After it has been kept a sufficiently long time, it is strained through thick cotton bags and the residue pressed in the same manner as in *sake* pressing. Before filtering, honey is sometimes added in the proportion of 10 *kin* to 1 *koku* of *Moromi* or mixed soy, in order to give it a sweet taste. Occasionally a sweet sake, obtained by taking 1 *koku* of *koji* to 7 *to* of water and 1 *to* of steamed rice, mixing them together and steaming for two hours, is added instead of honey. The residue obtained on pressing *moromi* is again mixed with salt and water, in the proportion of 8 *to* of salt to 1 *koku* of water and again pressed, this yields and inferior *shoyu*. Sometimes water is added to this second residue and it is again pressed. The residue first obtained is sometimes used as food, and the last residue as manure. One *koku* of the mixture, *moromi*, produces 4 *kuwamme* of residue at the first filtration and about 3.5 *kuwamme* of residue at the second and third. The *shoyu*, after pressing, is allowed to settle for two days in large tanks, and then drawn off and again filtered. *Shoyu* is a very important condiment, it is mixed with a great many kinds of food and is produced and consumed in very large quantities.

"1000 *Go* = 100 *Sho* = 10 *To* = 1 *Koku* = 4.929 Bushels. 1 *Kin* = 1.325 lbs. 1 *Kuwamme* = 8.28 lbs.

Note 5. This description of how shoyu is made contains several major errors.

Finally, there are chapters on alcoholic liquors (with emphasis on sake or "rice beer, sometimes called rice wine"), sweet liqueurs *(mirin, homeishiu, shiro-zake)*, food adjuncts (incl. salt, vinegar, spices, herbs, and perhaps shoyu), edible sea weeds (20 varieties, with both Japanese and scientific names, and an analysis of each), tea, tobacco, fodder, animal foods, dye stuffs, oils and waxes, and starch (incl. *kudzu, Pueraria thunbergiana)*.

Note 6. This is the earliest document seen (July 2008) concerning soybean products (tofu, dried-frozen tofu, and shoyu) in connection with (but not yet in) Australia.

Note 7. This is the earliest English-language document seen (Aug. 2003) that uses the word "nitrogen" in connection with soy–and with protein.

Note 8. This is the earliest document seen (July 2008) by Edward Kinch (1848-1920) that mentions soy. Kinch was born on 18 Aug. 1848 at Henley-on-Thames, Oxfordshire, England, the 3rd child of Charles Kinch and Emma Plumbe Kinch. He was baptised there on 12 Dec. 1845 in St. Mary's church. Kinch was a chemist, specializing in agricultural chemistry. In 1869 he became assistant professor at the Royal Agricultural College (RAC) in Cirencester (in southwestern England). From 1876 to 1881 he was a professor of agricultural chemistry at the Imperial College of Agriculture in Tokyo, Japan. Then from 1881 to 1915 he was professor of chemistry at the RAC in Cirencester. He married Edith Shirley Huntington in 1889 in Pembroke district, Pembroke, Wales. They had two children, William (born ca. 1886) and Dora Ann (born ca. 1893). He died on 6 Aug. 1920 in Haselmere, Surrey, England.

Note 9. This catalog was displayed at the Sydney International Exhibition, held in Australia in 1879. The Sydney International Exhibition was Australia's first international exhibition, a showcase of invention and industry from around the world. An imposing Garden Palace was constructed in the Botanic Gardens as a home for the exhibition. Address: F.I.C., F.C.S., &c., Prof. of Chemistry. Imperial College of Agriculture, Komaba, Tokio, Japan.

75. *Hawke's Bay Herald (New Zealand).* 1880. The use of the "Jew's ear" fungus in China. Jan. 9. p. 3.

• ***Summary:*** "According to a paper recently read before the Philosophical Society of Wellington, New Zealand, it appears that a large trade is carried on between that colony and China in the fungus known as 'Jew's ear.' This trade is practically restricted to a single species, *Hirneola polytricha*, Mont., which is very abundant on decaying timber in all the forest districts. Small quantities only of this fungus were exported before the year 1872; in that year, however, the amount declared at the various ports in the colony was 57 tons 14 cwt. [hundredweight], of the estimated value of 9,635 dollars; in 1877 it had increased to 220 tons 5 cwt., valued at 16,590 dollars...."

"China is the sole market for this fungus. The use to which the Chinese apply it is as a medicine for purifying the blood, administered in the form of a decoction. It is also used on fast days, with a mixture of vermicelli and bean curd [tofu], instead of animal food. It seems to be likewise largely used in soups as ordinary food, and is sold at retail at about twenty-five cents per pound."

76. *Gardeners' Chronicle (London).* 1880. The cultivation and uses of the soy bean (Soja hispida). 14:369-70. Sept. 18. [1 ref]

• ***Summary:*** "The cultivation of the Soy Bean (Soja hispida) is being strongly recommended in France as a green vegetable." Planting instructions are given.

"The greatest use to which the plant is put in China and Japan is in the preparation of soy [sauce] and of food from the ripe seeds. The manufacture of shoyu, or soy, is thus described in a descriptive catalog of agricultural products of Japan exhibited at the late Sydney International Exhibition [Australia; held in Oct. 1879]. Equal parts of Beans and Wheat are used..." The koji is made in shallow wooden boxes. "The mashings are removed to large vats, and kept there for at least twenty months, but more often for three or five years, the better qualities being those that are kept for the longer periods. The best soy is produced by mixing that kept for five years with that kept for three years. After it has been kept a sufficiently long time, it is strained through thick cotton bags, and the residue submitted to pressure. Before filtering honey is sometimes added. The residue is again mixed with salt and water and again pressed, the yield being soy of an inferior kind. Sometimes water is added to this second residue, and is again pressed. The residue first obtained is occasionally used as food, and the last residue as manure."

Note 1. It seems from the above text (and seems likely in itself) that both shoyu and the catalog describing the shoyu were exhibited at the Sydney International Exhibition of 1879. Address: England.

77. *Brisbane Courier (Queensland, Australia).* 1880. Imports (A special charge is made on consignees' announcements inserted in this column). Dec. 29. p. 2.

• ***Summary:*** "Claverhouse, s. [steamer], from Foochow via Hongkong and Cooktown: 1469 packages... 50 packages black tea, 5 boxes bean curd,... 100 cases China oil." Note: What is "China oil"?

78. *Clutha Leader (Otago, New Zealand).* 1881. Chinese superstitions. April 1. p. 2.

• ***Summary:*** "I propose in the present paper to follow an imaginary Chinaman from the cradle to the grave, and note a few of the superstitions by which he is bound."

On the first day after the birth of a child, the first idolatrous ceremony takes place. A feast is made to the 'Zong-kong zong-bo,' which seems to refer to a god and a goddess "who reside in the bed and look after the children, teaching them to talk and laugh in their sleep. Two large and ten small bowls of rice and some bean curd [tofu] are offered, candles lit, incense and gold paper burned. The idea connected with this feast is that a multitude of spirits have congregated, waiting for a chance of inhabiting a human frame, and as only one can enter the child, this feast is to conciliate the unsuccessful candidates, and induce them to disperse quickly in quest of another abode."

79. Filmer (Wm.). 1881. Wanted known, my second shipment of autumn seeds has arrived... (Ad) *Maitland Mercury & Hunter River General Advertiser (New South Wales, Australia).* April 28. p. 1.

• ***Summary:*** "... by mail steamer *Rosetta*, 146 varieties Flower Seeds, 60 of Vegetable Seeds, and 10 Herbs, Opium Poppy, Soya Bean, Eschalot Seed, Teosinte (New Fodder Plant). 12 Packets Flower, or 6 Packets Vegetable Seeds, Post free, 1*s.* 2*d.*

"Wm. Filmer, West Maitland." Address: West Maitland,

80. *Gardener's Monthly and Horticulturist.*1881. The soy bean. 23(275):337. Nov.

• ***Summary:*** "This–the Soja hispida–has been under culture in American gardens ever since Commodore Perry's memorable expedition to Japan. But no one seems to have known the use of it, and so it soon disappears, as, in the usual way of cooking it, any ordinary bean is better. Among Mr. Dreer's Japan collection at the State Fair [probably Pennsylvania] we noted that it again appeared, and we are moved to give the following from the Gardener's Chronicle, as showing how to use it:

"'The greatest use to which the plant is put in China and Japan is in the preparation of soy [sauce] and of various kinds of food from the ripe seeds. The manufacture of shoyu, or soy, is thus described in a descriptive catalogue of agricultural products of Japan, exhibited at the late Sydney International Exhibition [Australia; held Oct. 1879]. Equal parts of beans and wheat are used; a small part of the wheat is mixed with koji, which is an alcoholic preparation from rice, and allowed to ferment; the remainder is roasted, and the beans are also roasted. The roasted beans and wheat are then mixed together with the fermenting wheat, placed in shallow wooden boxes, and kept for some days at a fixed temperature in a warm chamber with thick walls, until the whole mass is covered with fungus. It is very important that the temperature of this chamber should be kept at the proper point. By these processes part of the starch of the wheat is converted into dextrine and sugar, and lactic acid and acetic acid are formed. It is then mixed with salt lye. The mashings are removed to large vats, and kept there for at least twenty months, but more often for three or five years, the better qualities being those that are kept for the longer periods. The best soy is produced by mixing that kept for five years with that kept for three years. After it has been kept a sufficiently long time, it is strained through thick cotton bags, and the residue submitted to pressure. Before filtering, honey is sometimes added. The residue, after pressing, is again mixed with salt and water, and again pressed, the yield being soy of an inferior kind. Sometimes water is added to this second residue, and it is again pressed. The residue first obtained is occasionally used as food, and the last residue as manure. (See *Gardeners' Chronicle*, vol. xiii., new series, pp. 178, 209, 242.)

"'Shoyu, or soy, is a very important condiment; it is mixed with a great many kinds of food, and is produced and consumed in very large quantities. Regarding the use of the soy bean as a vegetable in Japan, the writer of the foregoing remarks on soy says: 'It is the vegetable which approaches nearest in chemical composition to animal food (meat), containing, as it does, one-fifth of its weight of fat, and often two-fifths of nitrogenous matter. It is an extremely valuable adjunct to the food of a people who subsist so largely on a purely vegetable diet, of which the bulk is rice, so rich in heat producers–starch, and poor in flesh formers–albuminoids.'"

81. Palmer, R. 1882. The soy bean. *Gardeners' Chronicle (London)* 17:58. Jan. 14.

• ***Summary:*** "I am glad to see your notice of the Soja hispida or Soy Bean. My attention was first drawn to it by Dr. F. Watson as a most valuable article of commerce, owing to the large percentage of nitrogen it contains. It is grown largely in China, where an oil is expressed from it, which is used as salad oil, and the cake is then used as food by the inhabitants as well as given to cattle, and if in excess the cake is also used as a manure. The climate here, I believe, is too cold for it, but it might be grown in most of our colonies and become a large article of commerce. I tried to introduce it at the Cape, and also in Australia, but at that time without success: perhaps now people are wiser. The beans may be seen in the India museum, and also a copy of the analysis of them."

Note 1. This is the 3rd earliest document seen (March 2010) concerning soybeans (not including wild perennial relatives of the soybean) in Australia, Oceania, or South Africa. It is not clear whether or not the author took soybeans to South Africa and/or Australia, and whether or not he or someone else grew or tried to cultivate them there. He probably did take or send them there, and, if he did, attempts were probably made to grow them–but we cannot be sure of this.

Note 2. This is the earliest document seen (Sept. 2007) stating that soybean oil is used as a salad oil–in China of all places! Address: Brompton (North Yorkshire), England.

82. *Otago Witness (New Zealand).*1882. Gleanings. Jan. 21. p. 7.

• ***Summary:*** "M. Roman, a French engineer, states that the cultivation of the interesting plant, the soja or soya, has been largely developed in Hungary and in various parts of France. He thinks that it may in the future become as important an article of food as the potato. It grows in any soil, even the driest; and the plant is an excellent fodder for cattle. The seeds are very nutritious and have the form of small kidney beans. An agreeable soup [miso soup] may be made of them. The Chinese use them for various kinds of cheese [tofu, fermented tofu], to make a condiment with oil [soy sauce?], &c. In France the seeds are roasted like coffee, and M. Roman says the decoction of the soja bean is very similar to that of average coffee."

Note 1. This article also appeared (again in the "Gleanings" section) in the May 6 (p. 7) issue of this newspaper.

Note 2. This is the earliest document seen (March 2010) concerning soybeans (the soja or soya) in connection with (but not yet in) New Zealand.

83. Traveller. 1882. A new plant (Letter to the editor). *Evening Post (Wellington, New Zealand).* April 18. p. 3.
• ***Summary:*** "Sir–The value of the 'Soja Bean' has scarcely been heard of in New Zealand. I subjoin [append] a short description of it, and if any farmer, gardener, or gentleman who has land will undertake to raise and distribute the seed, I will procure him seed to start with. It is said to be capable of superseding all other kinds of cereal or vegetable food. I have no land of my own. You have my address.

I am, &c., Traveller.

"Following is the extract referred to:–'For centuries these heavy podded beans have fed the millions of Eastern Asia, and they are now favourite food in Southern Europe. The plant grows shrubby here and three feet high. The pod never drops its beans on the field. No other leguminous plant bears beans of such tasteful, healthy and nutritious qualities, in which the straw participates largely as fattening food for cattle.

"Analysis finds in Soja beans 34½ per cent. of albuminous element and 18½ per cent. of fat, while horse beans show only 25 and 1½ per cent. respectively, and maize contains 10½ and 4½ per cent. only. As an alternative crop the Soja bean will prove a blessing and a restorative to the soil anywhere."

Note 1. The subjoined description was first published as a letter to the editor as follows: *Sun (The)* (Baltimore, Maryland). 1882. Letter from the Pacific Coast (Correspondence of the *Baltimore Sun*). Feb. 13. p. 6. It begins: "San Francisco, Feb. 3, 1882. New plants from China and Japan are being added to the agriculture of California." When the seeds of two valuable trees were sent to California recently by the United States consul-general at Shanghai, these seeds were "distributed freely by the publishers of the *San Francisco Evening Bulletin.*"

"Last year the *Bulletin* distributed the Soja beans of Japan, which grow luxuriantly, and which will supersede all other varieties of food for men and animals.

Note 2. The Traveller apparently does not have soja beans with him, but does know how to obtain them on behalf of any interested New Zealanders who contact him. It is not clear whether or not he has ever seen a soja bean or a soja bean plant.

84. *Southland Times (Otago, New Zealand).* 1882. Diet of the Japanese. Oct. 6. p. 4.
• ***Summary:*** From: *Phrenological Journal:* This is a summary of an 1879 article by Prof. Edward Kinch, of the Tokio University. "Few natives, except officers in the capital, sailors and soldiers eat beef. Mutton and pork beyond the treaty ports are hardly yet known. About two hundred varieties if fish are eaten, one-half of the people eating fish every day. The food of the masses is 'ninety per cent. vegetable.'"

"The Soybean, which in chemical composition closely approaches animal fibre [sic, flesh], is extensively cultivated. Probably no country excels Japan in the variety of leguminous plants raised for food."

85. *Waikato Times (Waikato, New Zealand).* 1882. Gleanings: The soy bean. Dec. 7. p. 3.
• ***Summary:*** "A recent number of the *Agricultural Students Gazette* (Royal Agricultural College, Cirencester [England]) contains an article by Prof. E. Kinch on the Soy bean *(Soja hispida).* This bean, of which there are a dozen or more varieties known in the East, is very largely used as an article of food in Japan and China, where it is manufactured not only into soy [sauce], now exported in considerable to Europe, but also into bean cheese [tofu] and other forms of food..."

"Prof. Kinch is trying to grow one of the varieties in the Botanic Garden at Cirencester, and though our climate is probably too uncertain, and the temperature often too low for most of the varieties to attain perfection, if any of them could be acclimatized, a valuable leguminous crop would be added to our present list."

86. Gardner (Robt.) & Co. 1882. Classified ad: Japannese [sic, Japanese] "Soja bean." *Evening Post (Wellington, New Zealand).* Dec. 16. p. 3, col. 4.
• ***Summary:*** This small ad reads: "A fine sample of this celebrated Bean to be had on receipt of 18 postage stamps. Sow in December; mature in February."

Note:

Note: This is the earliest document seen (March 2010) concerning soybeans in New Zealand. This document contains the earliest date seen for soybeans in New Zealand (16 Dec. 1882). The source of Mr. Gardner's soybeans is unknown. It is also not known whether or not Mr. Gardner has ever cultivated soybeans in New Zealand, or even seen them cultivated in New Zealand by others. Address: Lambton-quay, Wellington.

87. *Brisbane Courier (Queensland, Australia).* 1883. Imports (A special charge is made on consignees' announcements inserted in this column). June 9. p. 4.
• ***Summary:*** "Venice, s. [steamer], from Hongkong: 46 cases merchandise,... 47 boxes soy [sauce],... 1 bag seaweed,... 18 packages preserved ginger, 5 boxes bean curd. 15 boxes sauce, 8 baskets ginger,... 10 boxes bean cake,... 5 boxes bean stick" [dried yuba].

Note 1. Bean cake, which is apparently a food, is probably fermented tofu, but could possibly be dried frozen tofu.

Note 2. These goods are clearly for Chinese customers.

Note 3. This is the earliest document seen (Jan. 2010) that clearly mentions yuba being imported or exported.

88. *Taranaki Herald (New Zealand).* 1883. The Budget, or Taranaki Weekly Herald. Oct. 22, 23, 25 and 26. p. 4.
• ***Summary:*** On page 2 of *The Budget*, in the "Notes and echoes" section is an article about "Soy beans."

89. *Wanganui Chronicle (Manawatu-Wanganui, New Zealand).* 1883. Local and general: A new bean. Oct. 30. p. 2.
• ***Summary:*** "Mr. James Laird has introduced into this district [Wanagui / Whanagui, on the southwest coast of the North Island of New Zealand] a very prolific and nutritious bean called the Soja. This cereal, which is an important addition for vegetable garden and farm purposes, was (so far as Europe is concerned) originally developed in Hungary [through the work of Friedrich Haberlandt in Vienna, Austria-Hungary], whence it extended to general consumption in many parts of Italy and France, in which countries it is supposed that the Soja will probably play as important a part in the future as the potato. The seeds take the form of small kidney beans, but their nutritive properties are far greater than the beans and lentils usually employed for food. Besides the ordinary soup and other dinner table purposes, the beans are in France roasted like coffee, and the Soja, mixed with milk, becomes a fragrant and appetising decoction.

Although the Soja has scarcely ever been heard of in New Zealand, it has for centuries fed the millions of Eastern Asia, and has become the favorite food of Southern Europe [sic]. In this colony [New Zealand] the plant grows like a shrub, and reaches a height of three feet, the pods never dropping their beans on the ground. No other known leguminous plant bears beans of such tasteful, healthy and nutritious qualities, or contributes such a proportion of straw adapted for fattening food for cattle.

"Analysis discovers in the Soja bean 34½ per cent. of albuminous matter and 18½ per cent. of fat. Horse beans show only 25 per cent. of the one and 1½ per cent. of the other, and maize only 10½ and 4½ per cent. respectively.

"As an alternative crop, Soja beans will prove a blessing and a restorative to the soil anywhere. We apprehend that when the merits of this bean become known in the Wanganui district, Mr. James Laird will have many demands for seed."

Note 1. Edited portions of two articles, previously published in other New Zealand newspapers in 1882 (Jan. 21 and April 18) can be found in the text above, together with some new and important material.

Note 2. This is the earliest document seen (March 2010) concerning the cultivation of soybeans in New Zealand or in Oceania. This document contains the earliest date seen for the cultivation of soybeans in New Zealand (Oct. 1883), and the earliest clear date seen for the cultivation of soybeans in Oceania (Oct. 1883). The source of these soybeans was Mr. James Laird.

But who was Mr. Laird? How did he learn about soybeans? And where and from whom did he did he get his soybeans?

90. *Brisbane Courier (Queensland, Australia).* 1884. Imports (A special charge is made on consignees' announcements inserted in this column). April 8. p. 4.
• ***Summary:*** "Suez, A.C.J. and S.S.S. Company's s. [steamer], from Hongkong direct: 2,432 bags rice, 50 cases oil, 50 cases Chinese oil, 10 cases China oil,... 10 boxes bean curd,... 8 boxes salt beans [probably salted black beans; soy nuggets],... 54 boxes sauce,... 5 boxes bean sauce [perhaps soy bean sauce],..."

Note: The ambiguous term "bean sauce" is used in 4 issues of this Australian newspaper from 8 April 1884 to 8 March 1897.

91. *Brisbane Courier (Queensland, Australia).* 1885. Imports (A special charge is made on consignees' announcements inserted in this column). June 23. p. 4.
• ***Summary:*** "De Bay, s. [steamer], from Hongkong:... 30 cases 20 boxes, 10 packages and 38 bundles tea, 10 cases eggs, 4 boxes opium, 50 cases oil, 2,693 bags and 2 boxes rice, 5 boxes wine, 1 box beans,... 2 boxes beansticks [probably dry yuba],... 29 cases soy [sauce],... boxes bean cake [fermented tofu],... 4 boxes bean sauce,... 4 boxes sauce beans, 4 packages ginger,..."

92. *Sydney Mail (Australia).* 1885. Kitchen garden. Aug. 1. p. 11.
• ***Summary:*** "Those who are behind with planting still have a fair month's work before them..."

"Sow also salad plants of all kinds, and those who have fair large gardens might plant the soy beans and a few lentils.

Note: The previous sentence seems to assume that soy beans are fairly well known and available at this early date in the area of Sydney, Australia.

93. *Brisbane Courier (Queensland, Australia).* 1886. Imports (A special charge is made on consignees' announcements inserted in this column). Nov. 20. p. 4.
• ***Summary:*** "Tannadine, from Hongkong: 10 baskets and 6 chests bean sticks [probably dried yuba],... 1 basket bean curd [tofu], 10 baskets [soya] bean sauce, 3 baskets salt bean [probably fermented black beans / soy nuggets],... 6 boxes preserved plums,... 4 boxes beans,... 15 chests soy [sauce], 1 chest Joss sticks,..."

94. Forbes, Francis Blackwell; Hemsley, William Botting. 1886-1888. Enumeration of all the plants known from China proper, Formosa, Hainan, the Corea, the Luchu Archipelago, and the island of Hongkong; Together with

their distribution and synonymy. *J. of the Linnean Society of London, Botany* 23:1-521. See p. 188-189. [14 ref]

• ***Summary:*** Discusses the following Glycine species: 1. Glycine hispida Maxim. Cultivated throughout China and Japan and other parts of Asia. 2. Glycine Soja, Sieb. et Zucc. Grows in Amur, Mandshuria [Manchuria], and Japan. "This may be the wild form of the foregoing cultivated plant, and it is treated as such by most botanists; but as it is so easily distinguished, we follow Maximowicz in keeping them apart."

3. Glycine tabacina, Benth. Described near Amoy in Fokien [Fukien / Fujian province] by Sampson, and at Whampoa [Huangpu] in Kwangtung [province in southeastern China, which contains Canton] by Hance. Grows in New Caledonia, and very widely diffused in Australia.

4. Glycine tomentosa, Benth. Described at Talienwhan in Shingking by Swinhoe, hb. Hance, and at Amoy in Fokien by Sampson, hb. Hance, and at Tamsui in Formosa [today's Taiwan] by Oldham. Grows in the Philippine Islands and Eastern Australia. "[Walpers, in Nov. Act. Nat. Cur. xix., Suppl. i. p. 324, records *Johnia Wightii*, Wight et Arn. = *Glycine javanica*, Linn., a common Asiatic and African plant from Cape Lyngmoon.]"

The frontispiece, facing the title page, is a detailed, fold-out map showing all of China and Corea [Korea], showing Chinese provincial boundaries, and major cities and rivers.

Note: This is the earliest document seen (Jan. 2001) concerning soybeans (but only wild perennial relatives of soybeans) in Taiwan; cultivated soybeans had not yet been reported in this country. No mention is made of soybeans or their wild perennial relatives in Korea or Hong Kong.

See also: The peanut (p. 171) "*Arachis hypogaea...* a South-American plant, is cultivated in China, as in most warm countries.

Pueraria Thunbergiana (p. 191-92; long and detailed discussion, with many references). Address: 2. Asst. for India in Herbarium of the Royal Gardens, Kew.

95. Church, Arthur Henry. 1886. Food-grains of India. London: Published for the Committee of Council on Education by Chapman and Hall, Ltd. 180 p. See p. 140-44. Illust. Index. 27 cm. 35 plates, with Fig. 26 being of the soybean. South Kensington Museum science handbooks. With 23-page supplement, 1901. Reprinted in New Delhi, India in 1983 by Ajay Book Service. [17 ref]

• ***Summary:*** "The soy-bean. *Glycine Soja,* Sieb. and Zucc. *Synonyms*–Soja hispida (Moench.); Dolichos Soja (Linn.); Soja angustifolia (Miq.). *Hind.* [Hindi]–Bhat, Bhatwan. *Punjab* [Panjabi]–Bhút. *Beng.* [Bengali]–Gari-kulay. *Naga*–Tsu-dza.

"This important bean is the seed of Glycine Soja, a small, sub-erect, trifoliate, hairy annual, with pods generally 3 to 4-seeded. It belongs to the natural order Leguminosae, sub-order Papilionaceae, tribe Phaseoleae, and sub-tribe Glycineae; 5 genera are included in this sub-tribe. Glycine contains about 12 species, chiefly Australian, but 3 are Indian, namely *G. javanica, G. pentaphylla,* and our present species.

"The soy-bean forms a considerable article of food in China and Japan. Since 1873 it has been successfully grown, as an experiment, in some of the warmer parts of Europe. It is widely spread in the outer Himalaya, and tropical regions from Kumaun to Sikkim, and the Khasir, and the Naga Hills to Upper Burma. It is often cultivated, rather largely in Busti and Gorakhpur [in today's Uttar Pradesh], Patna, and Purniah [Purnea] Districts [both in today's northeast India].

"This crop is generally grown by itself; the seeds are sown from June to September; the harvesting takes place between November and January. It is consequently a kharif crop. The seeds should be placed at a depth not exceeding 1 to 1½ inch; 18 plants may be left, after weeding and thinning, to the square yard. A peaty soil, or one rich in organic matter, suits the plants best; a calcareous soil is also favourable to its growth. Sulphate of potash is a good manure, nitrogen may be supplied either as nitrate of soda or, in the case of soils poor in organic matter, in the form of rape or mustard cake, but it is rarely needed, while large applications of nitrogenous manure exert a distinctly injurious effect upon the yield of beans. So far as we know, this very important, vigorous, and productive pulse is not attacked by any insect or parasitic fungus."

A full-page illustration (p. 141) shows the upper part of a soy-bean plant, with flowers and a lengthwise cross section of one of the pods.

"Very few vegetable products are so rich as this bean at once in albuminoids and in fat and oil, the former constituent amounting to 35 per cent., and the latter to 19. The cultivation of the pale large-seeded varieties should be extended."

A table titled "Composition of soy-beans" (p. 143) shows that the seeds contain 35.3% protein, 18.9% fat, 4.6% ash, 11.0% moisture. "The nutrient-ratio is here about 1:2, while the nutrient-value is 105. Potash forms nearly one-half, and phosphorus-pentoxide one-third of the ash of the soy-bean. Ripe soy-beans require long soaking, preferably in warm water, in order to render them soft.

"In China and Japan three preparations are extensively made from the soy-bean. Soy sauce is the best known of these, but more important are the soy or bean cheeses, and a kind of paste. The beans are sometimes pressed for the sake of the oil they yield; the residual cake forms an extremely rich cattle food, containing as it does 40 per cent. of flesh-formers and 7 per cent. of oil. The soy-bean may also be grown as a fodder plant. If cut just when the pods are fully

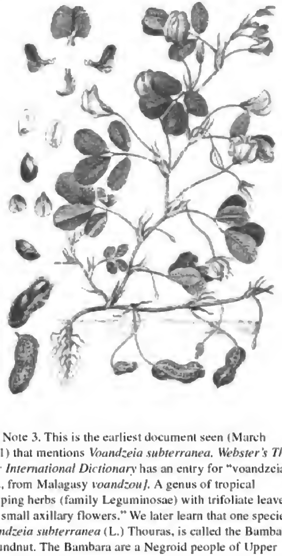
formed it makes an excellent hay, superior to that of the lentil."

Note 1. This is the earliest English-language document seen (Feb. 2004) that uses the word "cheeses" or the term "bean cheeses" or (by implication) "soy cheeses" to refer to tofu.

Note 2. This is the earliest document seen (Feb. 2004) concerning soybeans in Bengal (and therefore probably in today's Bangladesh). *Webster's New Geographical Dictionary* (1988) defines Bengal (earlier Bengal Presidency) as a former province in northeast British India, and now a region encompassing West Bengal, India, and Bangladesh. The capital was Calcutta, located on the Hooghly River about 90 miles from its mouth. Calcutta is now the capital of West Bengal, India. Dhaka (Dacca) is the capital of Bangladesh. Bangladesh was formerly East Bengal (part of India, 1700s-1947), then East Pakistan, 1947-1971. It became Bangladesh in 1971.

This one of the earliest document seen (March 2001) that clearly refers to soybeans growing in Burma, but it is not clear whether these are cultivated or wild soybeans.

Page 127 discusses "The Pea-Nut. *Arachis hypogaea,* L." Six local vernacular names are given. "This plant is probably of American origin, although it has long been cultivated in India, on the West Coast of Africa, and in many other tropical countries. There is a similar plant, *Voandzeia subterranea* [Bambara groundnut], allied to Vigna, which grows under the same conditions." The composition of pea-nuts (in 100 parts and in 1 pound) is given. "Half the weight of pea-nuts is oil... Pea-nuts, after the greater part of the oil has been extracted by pressure, yield a cake well adapted for feeding cattle." An excellent full-page illustration (line drawing, p. 126) shows the pea-nut plant with seeds growing under ground and details of flowers and seeds.



Note 3. This is the earliest document seen (March 2001) that mentions *Voandzeia subterranea. Webster's Third New International Dictionary* has an entry for "voandzeia: [NL, from Malagasy *voandzou]*. A genus of tropical creeping herbs (family Leguminosae) with trifoliate leaves and small axillary flowers." We later learn that one species, *Voandzeia subterranea* (L.) Thouras, is called the Bambara groundnut. The Bambara are a Negroid people of Upper Niger.

Note 4. This is the earliest English-language document seen (Oct. 1999) that contains the term "nitrate of soda" (as a fertilizer) in connection with soy-beans. It was later renamed "sodium nitrate."

This is the earliest document seen (Oct. 2002) that uses the word "kharif" to refer to the rainy season in South Asia. Address: Prof. of Chemistry, Royal Academy of Arts, London.

96. *Mataura Ensign (Otago, New Zealand).* 1887. The household. 6(636):2. Jan. 21

• ***Summary:*** "Worcestershire Sauce–Mix together 1½ gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, ½ gallon Maderia [Madeira] wine, ½ gallon Canton soy [sauce], 2½ pounds moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1½ ounces each of pimento and coriander, 1½ ounces chutney, 3/4 ounce each of cloves mace and cinnamon, and 6½ drams of assafoetida [asafoetida] dissolved in 1 pint brandy 20 above proof. Boil 2 pounds hog's liver for 12 hours in 1 gallon of water, adding water as required to keep the quantity; then mix the boiled liver thoroughly with the water; strain it through a coarse sieve. Add this to the sauce."

Note: This early recipe for Worcestershire sauce contains soy sauce (Canton soy) as an ingredient.

97. *Otago Witness (New Zealand).* 1887. Miscellaneous. Feb. 11. p. 8.

• ***Summary:*** From The Standard: "The cultivation of the Soy bean (Soja hispida), extensively used in Japan, is being recommended in the United States, where it has been tried on a small scale. It is a round, yellowish-white bean, which is constituents is said to come nearer to animal food than any other vegetable. According to an article published at the Educational Museum of Tokio, this bean was first raised in China about 200 years B.C. [sic, 11th century BC] and its use in Japan dates back to the fourteenth century [sic, at least the 8th century]. In the latter country it is chiefly used as 'tofu' or bean curd, which is cooked in various ways. Analysis shows that the bean contains 37 per cent. of albuminoids, and nearly 21 per cent of fat. In Germany the Japanese bean has been cultivated with success."

98. *Brisbane Courier (Queensland, Australia).* 1888. Field naturalists' outing. June 1. p. 3.

• ***Summary:*** "An outing at the Pine River had for some time been on the program of the field naturalists' section of the Royal Society. The Queen's birthday afforded the opportunity."

"*Glycine clandestina* in flower" was among the plants observed.

99. *Brisbane Courier (Queensland, Australia).* 1888. New fodder plants. Oct. 10. p. 7.

• ***Summary:*** "The department of Agriculture in the early part of the present year requested Messrs. Vilmorin, Andrieux, and Co., the eminent seedsmen of Paris, to procure seeds of various wheat, fodder, and other plants of economic value in small quantities for the purpose of testing the suitability of the Queensland climate for the growth of and acclimatization of these plants. Messrs. Vilmorin, Andrieux, and Co., in response, have forwarded a good variety of seeds, among which are the following fodder and economic plants: -

"Northern and hardy lucerne... Soja hispida (black seeded), Quinoa blanc, Soja bean, Soja hispida, Lotus major. These plants being necessarily supplied in very small quantities have been placed with certain farmers in widely distant parts of the colony, so that the diverse aspects of the various climates of Queensland upon the growth may be noted, and record of which will be kept and forwarded to the department, and of such plants as prove likely to thrive here seeds will be kept and distributed gratuitously to farmers during the next planting season in those districts where the test of experience has proved them to be of commercial value."

100. Hawson (H.). 1889. Wanted, &c.: Gawne's Worcestershire sauce.... (Ad) *Southland Times (Otago, New Zealand).* May 4. p. 3.

• ***Summary:*** "... Equal to imported, at half the price, try it."

Note 1. This is the earliest document seen (Feb. 2010) that mentions Gawne's Worcestershire Sauce, made in Dunedin, New Zealand. Does it use soy sauce as an ingredient? If so, how and from what manufacturer does it obtain that soy sauce.

Note 2. This ad appeared in this newspaper on May 4, 11, 18, 28, 29, June 1, 6, and 26, 1889. Address: Agent for Invercargill [New Zealand].

101. **Product Name:** Gawne's Worcestershire Sauce.
Manufacturer's Name: Gawne (W.).
Manufacturer's Address: Dunedin, New Zealand
Date of Introduction: 1889. May.
How Stored: Shelf stable.
New Product–Documentation: Ad in *Southland Times* (Otago, New Zealand). 1889. May 4. p. 3. This ad in the "Wanted, &c." section states: "Gawne's Worcestershire sauce, Equal to imported, at half the price, try it. H. Hawson, Agent for Invercargill [New Zealand]."

Ad in *Southland Times* (Otago, New Zealand). 1891. March 6. "H. Hawson, importer. Wine, spirit, and general merchant. Tay and Wood Streets, Invercargill. Agent for... W. Gawne, Dunedin, Sauce manufacturer."

102. T. de L. (Terrien de Lacouperie). 1889. Ketchup, catchup, catsup. *Babylonian and Oriental Record* 3(12):284-86. Nov. [11 ref]

• ***Summary:*** "My attention was called lately by my friend Col. Sir Henry Yule, to this word for which a Chinese origin has been suggested." After arguing in detail that W.H. Medhurst's *English and Chinese Dictionary* (Shanghai 1847) cannot be trusted, he concludes: "The Cantonese *Kwai-tchap* might be the antecedent of the English word, but it results from the unsatisfactory evidence of various sorts here adduced, that the etymology is altogether theoretical. My impression is that the word may have a Chinese origin, but not from China. It may have come from Australasia or the Malay peninsula, where the Chinese colonists of southern China are so numerous. The expression may have been made there, with a local acceptation unknown in the mother country."

Note: *Webster's Dictionary* defines catsup (pronounced KECH-up or KACH-up, derived from the Malay *kêchap* = a spiced fish sauce, and first used in 1690) as "a seasoned tomato puree." Under ketchup, *Webster's Dictionary* simply states "var. of Catsup" without giving a year of earliest known usage.

103. Forbes, Francis Blackwell; Hemsley, William Botting. 1889-1902. Index flora sinensis: Enumeration of all the plants known from China proper, Formosa, Hainan, the Corea, the Luchu Archipelago, and the island of Hongkong; Together with their distribution and synonymy. 3 vols. London: Taylor and Francis. Illust. 22 cm.
• ***Summary:*** The contents of this book is identical to the three articles that appeared in the *Journal of the Linnean Society*, vols. 23, 26, and 36. Glycine species were discussed in Vol. 23. See p. 188-189.

104. *Agricultural Gazette of New South Wales*.1890. Commercial plants: List of commercial plants that can be grown successfully in the northern parts of New South Wales. 1(Part 1):136-39. July.
• ***Summary:*** "Edible legumes and pulses: *Dolichos soya*. Linn.–Chinese soy plant."

Other plants in this category include (a scientific name is given for each): Chick pea or gram, Egyptian kidney bean (*Dolichos lablab*. Linn). Yam bean (*Dolichos tuberosas*. Linn.). Lentil. Lima bean.

"Plants or their seeds which yield commercial oils: Japan candle nut. Candle nut. Pea-nut (*Arachis hypogæa*. Linn.). Hemp oil plant (*Cannabis sativa*. Bauh.). Earth or ground almond (*Cyperus esculentus*. Linn.). Cotton plant (*Gossypium herbaceum*. Linn.). Ramtil oil plant (*Guizotia oleifera*. D'C.). Sun flower (*Helianthus annuus*. Linn.). Linseed oil plant (*Linum usitatissimum*. Linn.). Madia oil plant (*Madia sativa*. Molin.). Olive oil tree (*Olea europea*. Linn.). Poppy oil plant (*Papaver somniferum*. Linn.). Aniseed (*Pimpinella anisum*. Linn.). Castor oil plant (*Ricinus communis*. Linn.). Gingelly oil plant (*Sesamum indicum*. Linn.)."

Nut bearing plants and trees: Long-fruited almond (*Amygdalus communis var. macrocarpa*. Linn.). Pea-nut (*Arachis hypogæa*. Linn.). Earth or ground almond (*Cyperus esculentus*. Linn.). Queensland nut (*Macadamia ternifolia*. F.V.M.). Bambarra ground-nut (*Voandzeia subterranea*. Thou.). Address: Dep. of Agriculture.

105. Boerlage, J.G. 1890. Flora van Nederlandsch Indie [Flora of the Netherlands Indies (Indonesia)]. Leiden: E.J. Brill. See Vol. 1, p. 370-71. Index. 22 cm. [3 ref. Dut]
• ***Summary:*** There are about 12 species of Glycine in tropical Africa, Asia, and Australia. The genus *Glycine*, according to the opinion of Bentham and Hooker, consists of two sub-genera: 1. Glycine, in the limited sense; 2. Soya, which is distinguished by its wide, sickle-shaped pod. In the past, writers considered both a genus. The approximately four varieties found in the Dutch Indies belong to the second subgenus, which was described by Miquel, also under the name of *Soya* Savi. Both kinds, which can be found in Miquel's *Flora* under the name of *Glycine*, are classified in the genus *Teramnus* Sw. by Bentham and Hooker. Address: Dr., Conservator aan 's Rijks Herbarium te Leiden.

106. Rita. 1891. The ladies' column. *Bush Advocate (Hawke's Bay, New Zealand)*. Oct. 3. p. 7.
• ***Summary:*** One section reads: "Indian soy [sauce].–Indian and Japanese soy prepared from the dolicas saja [sic, Dolichos soja], termed by them 'soga' [sic, shoyu, soya?]. A good imitation is made as follows: Take one gallon or haricot or kidney beans; boil till soft; add bruised wheat one gallon. Keep in a warm place 24 hours, then add one gallon common salt, 2 gallons water; put the whole in a strong jar, bung it up for two or three months, stirring frequently, then press out the liquor."

Note: This same recipe appeared in the *Evening Post* (New Zealand) on 27 Feb. 1892.

107. Turner, Fred. 1891. New commercial crops for N.S. Wales: The cultivation of the soy bean (*Soja hispida*, Moench.). *Agricultural Gazette of New South Wales* 2(11):648-50. Nov.
• ***Summary:*** "The soy bean is indigenous in India, Japan and China. There are numerous varieties of the plant cultivated in those countries, including both tall and dwarf-growing kinds, but it is the large-seeded varieties of the latter which I would particularly recommend for cultivation in this Colony, because they are not only more easily managed, but, generally speaking, are more productive to any given area than the tall growing kinds. The dwarf soy is an annual hairy growing plant, growing about 2 feet high, with trifoliate leaves, and small flowers borne is short axillary racemes. These are succeeded by oblong three or four seeded hairy pods. As will be seen from the engraving of the plant, it is a good deal like the ordinary dwarf kidney bean in its habit of growth, but differs materially in the superior quality of the pulse which it yields. The very productive and pulse yielding plant has been cultivated in Asiatic countries probably from time immemorial, but only within the past twenty years or so has it attracted the attention of European cultivators. In the southern parts of

Europe, the cultivation of the dwarf kinds have proved a great success, and in France they are said to be an important crop.

"Some of our leading seedsmen have now become aware of the value of the soy bean, and seeds are now obtainable in Sydney. The plant has already been grown in a small way in a few places in this Colony, and has proved itself well adapted to our climate, so that there is no risk in attempting its cultivation here, in suitable places, on a large scale."

Note 1. This is the 2nd earliest document seen (March 2010) that clearly refers to the cultivation of soybeans in Australia or Oceania. This document contains the 2nd earliest clear date seen for cultivation of soybeans in Australia or Oceania (Nov. 1891). The source of these soybeans is unknown.

"Moreover it is not only a vigorous growing and a heavy yielding pulse plant, but it appears to keep remarkably free from both insects and fungoid pests." Note 2. This is the earliest English-language document seen (Aug. 2007) that uses the word "fungoid" to refer to fungal.

"Having eaten the seeds of the soy bean, I can say that they are an excellent addition to the pulse yielding plants we have already under cultivation. As regards their chemical composition I cannot do better than quote the analyses of Professor Church and Dr. Forbes Watson. 'Although there are a number of varieties of the soy bean, the chief differences between them lying in the size, shape, and colour of the seeds, yet these varieties are not distinguished by definite differences in chemical composition. That composition entitles the soy bean to the highest place, even amongst the pulses, as a food capable of supplementing the deficiencies of rice, and of other eminently starchy grains. Very few vegetable products are so rich as the bean at once in albuminoids and in fat or oil, the former constituent amounting on the average to 35 per cent, and the latter to 19 per cent. The cultivation of the pale large seeded varieties should be extended."

Facing this first page is a full page illustration of a soy bean plant, titled *Soja hispida,* Moench. "Soy Bean." with an enlarged pod (A) and seed (B). It has been copied from an 1882 issue of *The Garden* (July 29, p. 93) then modified slightly.

Two tables are titled "Composition of soy bean." The first, by Professor Church, shows the composition in 100 parts [percentage] and in 1 lb. The second by Dr. Forbes Watson, shows the composition with husk and husked.

"'The nutrient ratio here is about 1.2 while the nutrient value is 105. Potash forms early one-half and phosphorus pentoxide one-third of the ash of the soy bean. The beans are sometimes pressed for the sake of the oil they yield; the residual cake forms an extremely rich cattle food, containing as it does 40 per cent. of flesh-formers [albuminoids = proteins], and 7 per cent of oil.'"

Soja hispida, Moench.
"Soy Bean."

"The soy bean can be grown nearly all over that portion of the Colony where late spring or early autumn frosts do not occur, and with irrigation it might prove a valuable plant to grow in the interior. A good guide to go by is to cultivate the plant in those parts where the kidney bean will flourish, and this is over an immense area of New South Wales. The soybean is rather an exhausting crop, therefore it should be an alternating one. It would do very well to follow after a root crop. To obtain the best results it should be grown on a moderately light, well drained, and well worked soil that is rich in organic matter. The plant will grow well enough on other kinds of soil provided that they are drained, and well worked, and, if not naturally fertile, some suitable manures are applied. If well rotted farm-yard manure is not available, then sulphate of potash, or nitrate of soda, might be used with advantage. If farm yard manure is applied to the land, it should be ploughed in some time previous to sowing the crop, or it might have a tendency to cause a too rank growth of the plants, at the expense of the yield of beans. Commercial manures may be used on the land when it is prepared to receive the crop.

"Sowing the seed. From the Hunter to the Tweed Rivers, it would be possible to obtain two crops in the year by sowing in October, then again in December if there is a sufficient amount of moisture in the soil. South of the

Hunter River, however, it will be hardly likely that more than one crop can be harvested during the year. The seed for this should not be sown before the middle of October, or the beginning of November, according to situation. It would perhaps be as well to state that the young plants are very susceptible to frost, 2° Fahr. being quite enough to blacken them." Gives more details on sowing, then a paragraph on harvesting.

The last section is titled "Uses: The beans can be picked from the plants whilst green, and cooked and eaten without previous preparation. Ripe soy beans should, however, be steeped in warm water for some time before they are cooked, otherwise they will remain almost as hard as they were before cooking. In China and Japan the soy bean cheese [tofu] and a kind of paste [miso] are important articles of food. In those countries also soy sauce is made from the beans, which is not unknown to European palates. The sauce is said to be made in the following way. Boil the beans with equal quantities of wheat or barley, and leave it for three months to ferment, after which salt and water are added, and the liquid strained. Soy sauce is extensively used in Asia, and to some extent in Europe for flavouring certain dishes, especially beef, and it is supposed to favour digestion."

108. *Brisbane Courier (Queensland, Australia).* 1892. Imports (A special charge is made on consignees' announcements inserted in this column). Jan. 7. p. 3.
• ***Summary:*** "Taiyuan, s. [steamer], from Hongkong:... 3,260 bags rice, 16 packages tea,... 5 cases preserved ginger, 7 boxes beans, 10 cases oil, 23 boxes shamsho, 2 boxes bean curd,... 5 boxes soy [sauce], 2 boxes eggs,..."

109. *New Zealand Tablet (National).* 1892. Why buy a small bottle of Lea and Perrin's Sauce when you can buy a large bottle of Gawne's Worcestershire Sauce,... (Ad) Jan. 15. p. 16.
• ***Summary:*** "... of equal quality, and nearly double the quantity, for about half the price... It has a peculiar Relish and Piquancy; is a thorough Appetiser and Tonic, and will agree with the most Delicate Stomach. Gawne's Worcestershire Sauce is all that the most exacting connoisseur could wish, and should find a place in every household."

110. *Agricultural Gazette of New South Wales.* 1892. Notes on economic plants. 3(4):241-44. April.
• ***Summary:*** The section titled "The soy bean *(Soja hispida,* Moench)" states (p. 244): "In the issue for November [1891, p. 648-50] appeared an article on the cultivation of the soy bean in connection with which the following facts should be of considerable interest as proving the suitability of this bean as a commercial crop. One dozen seeds were handed to an officer of the Department, and sown by him at Summer Hill, near Sydney, in ordinary garden soil in the first week of last December. A sprinkling of No. 3 Sugar Company's manure was the only fertilizer used, and the plants received about the same amount of attention in the shape of watering and hoeing as the other vegetables in the garden. From the twelve seeds four moderately good plants were raised; the rate of growth being about the same as ordinary dwarf beans. The yield on picking on the 3rd March last, resulted as follows: -

"1st plant–29 pods.
"2nd plant–43 pods.
"3rd plant–15 pods.
"4th plant–23 pods.

"A number of these plants contained three seeds, others two, and the remainder one only, so that taking two seeds to the pod as an average–certainly a low estimate–the crop from the four seeds which germinated amounted to no less than 220 seeds. In regard to this result it must be bourne in mind that the seeds sown were imported, and probably old, and that according to all previous experience the yield from seeds matured here will be much greater."

Other economic plants mentioned in this article include: Early mastodon maize (from Ohio, USA). Early butter maize (From Messrs. Peter Henderson Co., New York). Johnson grass *(Sorghum halepense,* Pers.). Bokhara clover *(Melilotus leucantha,*W.). Linseed *(Linum usitatissimum,* Linn.). Honey-producing plants (Serradella), "Alfalfa," or Lucerne *(Medicago sativa).* Address: Dep. of Agriculture.

111. *Sydney Mail (Australia).* 1892. Vegetable garden. Sept. 3. p. 520, cols. 3-4.
• ***Summary:*** "As all the tender kinds of vegetables may be sown freely during September, this month is one of the busiest of the year... There is another variety of bean known as the Soy bean, Soja hispida, which is worth trying. It is grown in precisely the same manner as the French bean. Seed of the variety known as Soja d'Etampes can be obtained in Sydney. It grows to a height of from 2 to 2½ ft. 'This plant requires at least four or five months to complete its growth and come to maturity.'"

112. *Brisbane Courier (Queensland, Australia).* 1892. The field and garden: Reminders for November. Nov. 11. p. 6.
• ***Summary:*** From Queenslander: "In the South French beans may still be sown, but in the tropics the snake bean or the soya bean, the Madagascar bean, and its congeners should be looked to for a summer vegetable."

113. Hawson (H.). 1893. See what the newspapers say about Gawne's Worcestershire sauce (Ad) *Southland Times (Otago, New Zealand).* July 29. p. 2.
• ***Summary:*** Contains a long list of praiseful testimonials from the following New Zealand newspapers: *Southland Times, Evening Star, Otago Workman, Taieri Advocate, New*

Zealand Tablet, Globe, Southern Standard, Cromwell Argus, Oamaru Mail, Otago Daily Times, West Coast Times, Palmerston and Waikonaiti Times, Christchurch Press, and Dunstan Times.

Messrs. Gawne and Co., George street, Dunedin–which [as of Feb. 2010 is the second-largest city in the South Island of New Zealand, and the principal city of the region of Otago] make this sauce.

"Why buy a small bottle of Lea and Perrin's Sauce when you can buy a large bottle of Gawne's Worcestershire Sauce?" It is locally made and sells for about half the price of the imported article. Address: Agent [New Zealand].

114. Valder, George. 1893. Experiments with pulses. *Agricultural Gazette of New South Wales* 4(11):855-58. Nov.

• ***Summary:*** This article is mostly about trials with 10 different varieties of cow-pea *(Vigna catiang,* Endl.) obtained from Queensland, South Australia, New South Wales, and the USA.

However the last paragraph reads: "Reports on other species of pulses, including mung bean, gram, chick-pea, soy bean, Lima bean, pigeon-pea, etc., will appear in due course." Address: Dep. of Agriculture.

115. Valder, George. 1893. Experiments with pulses. *Agricultural Gazette of New South Wales* 4(12):914-17. Dec.

• ***Summary:*** The section titled "Soy bean *(Soja hispida,* Moench.) (p. 915-16) states: "Seeds of three varieties were obtained, viz., 'Common White,' obtained from a local seedsman; 'Improved White,' from the United States; and a black variety from Queensland... At first the plants grew rather slowly, but as the weather became warmer the growth was more rapid. When about 15 inches high the plants of 'Common White' and 'Black' were badly attacked by bean-rust, but, strange to say, the plants of 'Improved White,' which were growing next to these varieties, were not affected in the slightest degree."

The plants gave an average of 235 pods and 648 seeds per plant, or 2.7 seeds per pod. Improved White gave the best yield, 47 bushels/acre of dry pulse. Common White gave 13 bu/acre and the black variety gave 9 bu/acre. The latter two were "badly affected with bean-rust."

"The only fault that I could find with the Soy bean was that it was too slow in ripening its seed, it being nearly five months in coming to maturity, but I noticed that the plants grew best during the month of January, especially during one hot dry week, and I, therefore, believe that this plant is best suited to the warmer parts of the Colony. I should strongly recommend farmers to plant a small area with this crop, as the beans shelled out when quite green form a delicious vegetable, and the plants after the pods are taken off make very good feed for cattle.

"The department obtained a small quantity of seed of the common white variety and distributed it to a number of farmers in different parts of the Colony. The seed germinated badly, but most of the plants that were obtained grew remarkably well.

"Mr. J. Allison, Eglinton, Bathurst, reports as follows:–'The seeds received were very deficient in vitality, only three plants coming to perfection. These proved very vigorous and prolific, reaching a height of from 2 to 2½ feet, and bearing a quantity of delicious beans. I think this will prove a real acquisition to the list of choice vegetables.'

"Mr. J. Taylor, Reedy Creek, Rylstone, says:–'The Soy bean grows well in this district, attaining a height of 3 feet 6 inches, and being covered with pods. In fact, so heavily a crop did the plants bear that I was obliged to put in stakes and tie them up, in order to prevent the plants being broken down. The beans are delicious eating.'

"Mr. Charles Mapperson, junr., of Tattaila, Moama, states that he believes the Soy bean will stand the hot summer weather better than any other bean which he has yet tried, but it must be sown in the early spring."

Note 1. Since there were 17,000 Chinese in Australia by 1855 (see Australian Department of Immigration and Ethnic Affairs. 1985. "A Land of Immigrants"), a good historian could probably push these two dates back even further.

Note 2. Two of these soybeans "were badly affected with bean-rust." Is this soybean rust, or a "bean-rust" of another type? If it is soybean rust, this is the earliest document seen (April 2005) that mentions soybean rust on cultivated soybeans *(Glycine max).* Talk with Prof. Ted Hymowitz, Univ. of Illinois. 2005. May 31. Soybean rust is indigenous to Australia. Ted is not aware of any fungal disease called "bean rust" that is different from soybean rust. Moreover, regular beans are not very susceptible to soybean rust. This could well have been soybean rust, but we cannot say for certain. Address: Dep. of Agriculture.

116. *Bay of Plenty Times (New Zealand).* 1894. Feeding horses. March 2. p. 2.

• ***Summary:*** "Give them more nitrogenous food and less corn–Work horses: One sees the finest draft horses in the streets of English cities. Those equine monsters, the brewers' horses, black as coal, sleek and spirited, are strong enough to walk off with ease with a load of six or seven tons. The solid food of these giants of their race consists mainly of crushed oats or barley and beans, with sheaves of green barley and tares [perhaps the common vetch, *Vicia sativa,* a legume], in addition to the accustomed hay." Sometimes a dozen eggs are added to the regular food. "This is an excellent thing for the skin, and the coat glistens like satin under this kind of feeding.

"These horses have the advantage of the richest kind of diet in their beans. These contain as much nitrogen as lean beef, and for the restoration of wasted muscle caused by hard work the nitrogenous elements of food are specially useful. We have no such food for our horses on this side of the world [in New Zealand]. Our climate seems unfavorable for the growth of the crop, but we have a substitute almost precisely constituted in the dried brewers' grains which have recently come into the market. Peas have nearly the same composition as beans and might be used as a substitute for them, but the southern [U.S.] cow pea is a bean, and the soja bean, closely related, is equally rich in this needed nitrogenous matter. This bean is the choice food of horses in India and is well worth cultivation here as a partial substitute for our to starchy corn."

117. *Mataura Ensign (Otago, New Zealand).* 1894. Corea [Korea] and Coreans: Roasted dog and other delicacies. In search of a female. Sept. 29. p. 7.
• ***Summary:*** From NZ Press, by Fare Fac: "The Kingdom of Corea has for centuries been a bone of contention between China and Japan... But, with one exception, the Chinese have always come out victorious. This was in 1592," when Japanese forces invaded the country and defeated the Chinese. Five years later, however, the Chinese again became possessed of the country, and have held it as a suzerain ever since. It was the Japanese who gave the name to the outside world. The Chinese name is Tsiotsien, the native name Kaoli, and the Japanese name Korai, *Anglice* Korea or Corea."

The eastern slope is not very fertile, so most of the population lives on the western slope. Here they raise a little barley, rice and [soya] beans in the alluvial pockets of the foothills.

"The [soya] bean cake is the pressed marc of the pulse grown on the western shores. The oil is used internally and externally–it smells worst when it in used outside–also for lighting and lubrication. The marc is used for fuel and stock food. The bean cakes look exactly like 24 inch grindstones and are quite as soft."

118. *Age (The) (Melbourne, Australia).* 1894. [Vegetarianism in Japan]. Dec. 29. p. 4. [1 ref]
• ***Summary:*** This untitled article begins: "Japan is moving. The *Sei-i-kwai,* a medical journal published in Tokio, has a number of original articles in the English language, and while the tone and treatment are clearly imitative, there is nevertheless evidence of a certain originality of thought. The following of an extract from an article by Dr. Ishizuka on the Natural Food of Man affords a good example of the peculiar style and treatment." Observes that the teeth of men or closer in structure and movement to those of herbivorous, than of carnivorous animals. "Now, among the foods which are fitted to the normal teeth of men, there is nothing better than the cereals." "It is the general opinion at present that meat and vegetables are necessary articles for animal nutrition, but it is contrary to the principal purpose of creation... Consequently Shaka, the founder of Buddhism, separated days for abstaining from meat and fish in order to regulate the use of them, and Confucius also gave an instruction against the excessive use of meat. It will be clear then that meat is not an article of daily use."

"It is a well known fact that Buddhist monks never eat meat and fish, but they eat beans more than most people in various forms, *miso, natto,* etc."

119. Engler, Adolf; Prantl, L.K. 1894. Die Natuerlichen Pflanzenfamilien nebst ihren Gattungen [The natural plant families, together with their genera]. Leipzig: Verlag von Wilhelm Engelman. 396 p. See vol. 3. Part 3, p. 360-61, 392 (Fig. 131 B-D). [Ger]
• ***Summary:*** "390. Glycine L. *(Soja* Savi, *Johnia* W. et Arn., *Notonia* W. et Arn., *Leptocyamus* Benth., *Bujacia* E. Mey.)... There are about 15 varieties in tropical Africa, Asia, and Australia...

"Uses: *G. hispida* Maxim., the Japanese soybean is grown throughout East Asia for the pleasant tasting seeds; they serve also for the preparation of a pungent brown sauce, which in South Asia accompanies almost all meals and is also imported to Europe. The plants also thrive in Germany and are recommended for cultivation, however they do not always ripen in our climate, so their cultivation is unsure."

Illustrations (p. 362, Fig. 131) show (B) the leaves and flowers of a soybean plant (¼ size), and (C) an enlarged soybean flower (3 times normal size).

Also discusses the peanut (p. 324-25) with an excellent five-part illustration. Address: 1. Prof. der Botanik und Direktor des botan. Gartens in Berlin; 2. Prof. der Botanik und Direktor des botan. Gartens in Breslau.

120. Bowie (Robert). 1895. Sutter's Buildings (Ad). *Timaru Herald (Canterbury, New Zealand).* Nov. 30. p. 2, col. 3.
• ***Summary:*** "Has just landed ex 'Tokomaru' and 'Ionic' 54 cases new and seasonable goods, including Crosse and Blackwell's goods in great variety. Also Gorgona Anchovies,... Potted Meats, China Soy [sauce], Barrilla Ash Soap,..."

Note: This is the earliest document seen (Feb. 2010) in the New Zealand Newspapers database that contains the term "China soy."

121. Valder, George. 1895. Experiments with pulses. *Agricultural Gazette of New South Wales* 6(11):768-70. Nov.
• ***Summary:*** Section 2, titled "Soy bean *(Soja hispida,* Moench.)" states: "This plant has also proved very suitable for the Wagga Wagga district. Sown at the same time as the cow-pea, it took longer to produce its seed, but yielded 5 bushels per acre more, viz., 39 bushels per acre. The yield

of fodder, however, was not nearly so heavy, and I do not think it will ever compete successfully with the cow-pea as a forage plant. In many parts of the United States large quantities of cow-pea and soy-bean are made into hay, and it is intended to this season to carry out experiments as to their value for this purpose here."

Also has sections discussing: Cow pea *(Vigna catiang,* Endl.). Mung bean *(Phaseolus mungo,* Rox.). Pigeon pea *(Cajanus indicus,* Spreng.). Tangier pea *(Lathyrus tingitonus.)* Lima bean *(Phaseolus lunatus,* Linn.). Address: Wagga Wagga Experimental Farm [NSW].

122. Andes, Louis Edgar. 1896. Vegetabilische Fette und Oele, ihre praktische Darstellung, Reinigung, Verwerthung zu verschiedenen Zwecken, ihre Eigenschaften, Verfaelschungen und Untersuchung... [Vegetable fats and oils: Their practical description, purification, utilization for various purposes, properties, adulteration and examination]. Vienna, Austria: A. Hartleben's Verlag. xi + 347 p. Illust. 19 cm. Series: A. Hartleben's Chemisch-technische Bibliothek, Bd. 225. [Ger]

• ***Summary:*** A long and interesting table (p. 26-35) titled "Table of vegetable fats and oils, with their German, English, and French nomenclature, source and origin, and percentage of fat in the plants from which they are derived" contains the following six columns: German names. English names. French names. Plants from which obtained. Country of origin (incl. Oceania). Percentage of fat and oil in the seeds. The 148 oils are listed alphabetically by their German name.

The majority of the English-language names are no longer familiar, such as: Cashew apple, prickly poppy, ailanto, anda, tucum, apple kernel, cardon, galam, candlenuts (Origin: Oceania), ben, pear kernel, dika, Java almond, nettleseeds, niam, ramtil, ochoco, ocuba, etc.

More common oils (with their names in three languages) are: Charlock / Ackersenf-Ravison / Ravison d'Odessa. Himalayan apricot / Aprikosenkern / Amandes de l'abricot. Alligator pear / Avocado / Abacetier, Avocatier. Earthnut, Peanut / Erdnuss, Madrasnusse, Mandobi / Arachide, Pistache de terre (Origin: West Africa, India). Hempseed / Hanf / Graines de chanvre. German sesame, camelina / Leindotter / Cameline. Almond / Mandel / Amandes. Palm / Palm / Palme. Palm kernel / Palmkern / Palmish. Rapeseed / Raps / Navette. Rubsen seed / Rübsen / Navet (turneps [sic, turnips]). Sesame, till, benné / Sesam / Sesame.

In the chapter on "Non-drying vegetable oils (p. 121-87) are long sections about: Cyperus oil (Cyperus grass oil; *Erdmandelöl, Huile de souchet comestible).* Ground nut (Earth nut), arachis, or pea nut oil *(Erdnussöl, Arachidöl, Arachisöl, Mandoböl; huile d'Arachide, huile de pistache de terre).* Almond oil. Sesame oil (Gingely or Jinjilli oil), benné oil, til or teel oil. Soja bean oil (p. 166-67).

Concerning Soja bean oil *(Sojabohnenöl,* p. 184-85): The raw material has many names: Chinese oil bean, Sao, Soja bean, the fruit of Dolichos Soja L. = Soja japonica, Soja hispida, indigenous to China and Japan. The seeds, which are edible and possess a piquant flavor, contain soja bean oil, falsely designated 'huile de pois,' an oil used for alimentary purposes." A table, based on Meissl and Böcker, shows that the beans contain 30% soluble casein, 18% fat, 0.5% albumen, 7% insoluble casein, 2% cholesterin, lecithin, resin and wax, and 10% dextrin. The author does not know how this oil is prepared, but "it is probably obtained by pressing in the ordinary way." "Properties.– There is no information available on this score."

The chapter titled "Apparatus for grinding oil seeds and fruits" (p. 48-120) includes many detailed descriptions and excellent illustrations including: Edge runner mill (Anglo-American). Crushing roller mill. Seed crusher. Seed crusher (Anglo-American). Roller mill (Krupp). Improved heating pan. Wedge press. Hydraulic press. Pan presses. Cake moulding machines. Hydraulic press for round cakes.

In the section on "Improved export presses" (p. 87-90) is an illustration of an hydraulic press (manufactured by Rose, Downs & Thompson of Hull, England) with movable box which is "suitable for treating linseed, rape, sunflower, gingelly, sesame, mustard, poppy and niger seeds, decorticated and undecorticated cotton-seed, Chinese peas *(chinesische Erbsen* = soja beans), castor oil beans,... ground nuts, coprah,... palm kernels and olives." etc. Note 1. This is the earliest document seen (Jan. 2004) that discusses the hydraulic press in connection with soy beans.

"The universal extractor" (illustrated, p. 109) of J.G. Lindner & Merz, is designed to extract oil or fat from all fatty materials, including flax, hemp, sesame, ground nuts, pressed oilcake, etc.

In the chapter on "Vegetable drying oils" (p. 188-213) is a long section about Hempseed oil (p. 190-93). In the chapter titled "Oil-cake and oil-meal" (p. 318) is a table which gives the composition of the 16 "most important oil-cakes." Linseed cake and meal, ground nut cake (both undecorticated and decorticated) and sesame cake are listed; soja bean cake is not.

On about page 326Z is a "Table of constants of [39] oils and fats," including: Apricot kernel, arachis oil, hemp oil, almond oil, rape oil (Raps), Rape oil *(Rüböl),* sesame oil, whale oil. Soja oil is not mentioned. For each oil is given: Specific gravity at 15ºC. Saponification value. Iodine value. Hehner number. Reichert number. Acid number. Acetyl. Note: This is the earliest document seen (Feb. 2003) that uses the term "acid number" in connection with soybean oil.

Contains a good early history of oil milling (p. 1-8). The section titled "'Extraction' method of obtaining oils and fats" (p. 100-114) discusses the use of solvents such as carbon bisulphide, canadol, benzol, benzine, sulphuric ether, or carbon tetrachloride. Many specific commercial systems are described and illustrated including: Diess's extracting apparatus, Voohl's extractor, Seiffert's battery of extractors, and the Excelsior extractor (Wegelin & Hübner of Halle, Germany). Also discusses: Oil-extraction installations (building designs), press moulds and plates, and machine for trimming oil-cakes. Soy is not mentioned in connection with any extraction equipment.

Louis Edgar Andés lived 1848-1925.

123. Hooker, Joseph D. ed. 1896. Journal of the Right Hon. Sir Joseph Banks... during Captain Cook's first voyage in H.M.S. Endeavour in 1768-71 to Terra del Fuego, Otahite, New Zealand, Australia, the Dutch East Indies, etc. London: Macmillan and Co., Ltd.; New York: The Macmillan Co. li + 466 p. Illust. Index. 23 cm.

• ***Summary:*** Joseph Banks had a staff of nine men, including Daniel C. Solander (the Swedish naturalist who had been trained by the great plant classifier Linnaeus), three artists and four servants. They were among the 94 men who boarded the *Endeavour* commanded by Captain James Cook on 25 Aug. 1768 at Plymouth, England. Of these, 38 men died during this voyage around the world.

On 19 April 1770 (p. 261) they first sighted the coast of Australia southward of Cape Howe. Sailing northwards, they found no inlet or harbor until April 28 (p. 263-69), when they went ashore at Botany Bay, aptly named by Banks for its prodigal wealth of plants which kept him and Solander happy and busy for days. On June 14 they first saw a safe harbor in the mouth of a river, today called the Endeavour river (p. 279-91). Banks and Solander used this time to botanize. They killed an kangaroo and many large turtles, ate both, and became friendly with the indigenous people.

They left the harbour on August 4, continuing on to New Guinea, the Dutch East Indies, and the Cape of Good Hope. London lionized Banks on his return. Later Banks sponsored the trips of many experienced, professional plant hunters. Captain Cook had successfully circumnavigated the world, and Banks was largely credited with the strong scientific flavor of the voyage. Banks later became unofficial director of Kew Gardens.

Note 1. Sir Joseph Banks lived 1743-1820; Sir Joseph Dalton Hooker lived 1817-1911.

Note 2. Even though the soybean is not mentioned in this book, we know from the 1900 book titled *Illustrations of the botany of Captain Cook's voyage round the world in the H.M.S. Endeavour in 1768-71,* by Banks and Solander that they did collect two wild perennial relatives of the soybean, *Glycine tabacina* Benth. and *Glycine tomentosa* Benth. (see p. 22).

Note 3. Sunningdale is a suburb of East Berkshire, about 6 miles south-southwest of Windsor, England. Address: The Camp, Sunningdale [East Berkshire, England].

124. *Bruce Herald (Otago, New Zealand).*1897. Miscellaneous. Jan. 12. p. 6.

• ***Summary:*** "Vegetable meat of Japan, called "torfu" [sic, tofu], is said to consist chiefly of protein of the soya bean, and to be as nutritious and digestible as meat. It is sold in tablets, is white as snow, and tastes like fresh malt."

125. *Otago Witness (New Zealand).*1897. Pater's chat with the boys. April 1. p. 51.

• ***Summary:*** The section titled "Japan: Past and present" states: "Twenty years ago she [Japan] was an isolated nation, untalked of among the nations of the west; but she is now a great military, manufacturing, and commercial power, combining the maritime instincts of Britain with the go-aheadism of America, and so becoming the combined John Bull and Yankee of the Pacific. So afraid have the United States become of the competition of the lively Japs that one of the planks in the last election was exclusion of the Jap and his products." These protectionist measures are bound to fail for two reasons, which are given.

Japan is facing labour troubles and a rise in the cost of living, as a table shows. If 100 "is taken as the unit of cost of living in 1872," then "the figures below show the amount of advance since [to about 1897]:–Rice 100 to 161. Miso 100 to 189. Shoyu 100 to 158. Firewood 100 to 141. Charcoal 100 to 150. Cotton 100 to 150. Rent 100 to 228–or an average increase of 64 per cent., while wages have gone up only 33 per cent., or little more than half as much."

126. *Otago Witness (New Zealand).*1897. Otago Agricultural and Pastoral Society: Digestibility of fodder. April 29. p. 7.

• ***Summary:*** "From recent experiments, the Illinois Experimental Station concludes as follows:–The composition of cowpea ensilage corresponds very closely with that of clover hay, the important difference being in the higher percentage of fat found in the clover, but the digestibility of the cowpea ensilage is so much greater that it furnishes an equal amount of fat and much more protein and total energy than the clover hay.

"Soja bean ensilage resembles clover hay both in composition and digestibility. It furnishes an equal amount of protein, more fat, but less total energy than clover hay. Both of these leguminous forage plants draw upon the free nitrogen of the air in an indirect way for a part of their food supply; their composition shows a high percentage of nitrogen, and they have great value for improving the soil."

"As compared with cowpeas and soja beans, the maize fodder and maize ensilage have a much higher value for energy and fat production, but the cowpea ensilage and soja bean ensilage are much more valuable for animal growth or the production or the production of milk."

127. *Otago Witness (New Zealand).* 1897. Agricultural and pastoral news. May 13. p. 4.
• ***Summary:*** "Experiments in the making of silage are being extensively carried on at the various experiment stations in the United States. At the Massachusetts corned soja beans made an excellent silage...."

128. *Agricultural Gazette of New South Wales.* 1897. General notes. 8(6):433-35. June.
• ***Summary:*** The section titled "Leguminous crops for pigs" states: "The method adopted by Mr. Wilson, whose ideas are printed in the *American Agriculturist,* are given below, commends itself both as regards simplicity and economy. The chief expense of such as system would appear to be in the need for pig-proof fences; but with plenty of cheap timber, and the ingenious use of barbed wire, the outlay need not be heavy. Besides the addition of a lucrative branch to the farm, there is the direct advantage of land improved by the mere production of generous crops of legumes and the droppings of the animals of the animals that feed off them. It is far easier to manure land in this way than to buy expensive fertilizers and cart them to the paddocks.

"'Corn versus peas for hogs.–I have been raising hogs twenty years, feeding peas, peanuts, soja beans, &c., and find that corn makes the flesh much firmer and the lard whiter and firmer than when fed on any kind of peas. I am satisfied hogs will take on fat faster fed on peas than on corn. I think I have had hogs gain 2 lb. a day on peas and soja beans. My plan of feeding hogs is this: I sow the peas in one field and the soja beans in another; turn the hogs on the peas first and let them eat these, as they will rot sooner than the soja beans; then turn on the latter. When they get through the soja beans they are as fat as I want them, when I put them in a close pen and feed on corn two more weeks to harden. I do not want anyone to think I am opposed to peas and soja beans. I plant more beans than corn, and I think I get five times the profit from the first I do from corn.–W.H. Wilson, Norfolk Co., Va." [Virginia].

129. *New Zealand Tablet (National).* 1897. Science notes: The flavours of butter and cheese. Oct. 22. p. 27.
• ***Summary:*** "We learn some curious facts about butter and cheese from that section of Professor Marshall's learned Presidential Address on Botany, at the meeting of the British Association, which was devoted to the bacteriology of the dairy. To different forms of bacteria, he tells us, are due the distinctive flavours of varieties of butter and cheese..."

"The lecturer suggested that interesting results might be obtained from the investigation of the vegetable cheese [tofu] made in China and Japan from the curd of the soy bean, which is allowed to become mouldy in the process" [fermented tofu].

130. *Star (Canterbury, New Zealand).* 1897. In a Japanese inn. Oct. 23. p. 8.
• ***Summary:*** From *St. James's Budget:* The writer, who stayed in a traditional Japanese inn *(hatoga),* described eating a meal there. "The European traveller will be confronted with a variety of surprises." Of the soups, he liked the *wan mori* (clear soup) best. "*Chawan mushi,* or soup with eggs in it, thick and custard-like, containing minced meats, fish, vegetables, &c.; and miso shiru, or bean soup [miso soup], are also palatable.

"It is only within the last few years that the Japanese have begun to eat meat. Now, however, in most of the inns on the main roads *ushi nabe* will appear on the menu. This dish is composed of beef cut up small, stewed and served *aux fines herbes,* together with a liberal admixture of soy [sauce]. *Tori nabe,* or stewed fowl, is a similar dish and most appetizing. Soy gives a strong flavouring also to another esteemed dish, *unagi meshi,* or eels and rice."

131. *Sydney Mail (Australia).* 1897. Horticultural notes. Nov. 20. p. 1057.
• ***Summary:*** "The several thousand of Chinese residents in San Francisco are remarkable for their aversions to 'white devils' bread,' and for using in its stead a number of articles, either imported at considerable expense direct from China or grown by them in the rich alluvial valleys of California. One may frequently see offered for sale in the provision-dealers' stores in China-town, San Francisco, large baskets of yellowish-white lily-bulbs..."

"Among other things frequently met with in the provision stores of China-town are:–... Chinese cabbage, Brassica chinensis; sprouted seeds of the Soy bean, Glycine Soja; black, white, and green seeds of Glycine Soja, and a small, square, white cheese made from the same, wrapped in a yellow cloth, and bearing a brown Chinese monogram;..."

Note 1. This is an early report of soybeans, soy sprouts, and probably pressed tofu in California. It is the only document ever seen (Jan. 2010) describing pressed tofu being sold, wrapped in cloth, bearing a Chinese monogram [character] on the cloth. The source of this information is unclear.

132. Andes, Louis Edgar. 1897. Vegetable fats and oils: Their practical preparation, purification, properties, adulteration and examination. Translated from the German by Charles Salter. London: Scott, Greenwood & Son; New York: D. Van Nostrand Co. xv + 316 p. Illust. Index. 22 cm.
• ***Summary:*** Vegetable fats and oils play an increasingly important role in modern society because of great improvements in the processes of manufacturing and refining (incl. bleaching), and an increase in the number of

applications for which the oils are now used. "In place of the old primitive presses many establishments are now fitted with all the appliances suggested by the development of technical knowledge, both for expressing the oil from the seeds by mechanical means and for obtaining it by extraction [with a solvent], whereby the yield is greatly increased." Trade with distant lands, has led to the discovery of oil seeds hitherto unknown to Europeans (p. v).

The Introduction (p. 3-4) states: "The preparation of fatty oils in China was thus described by the Swedish sailor Captain Eckeberg in 1767: -" A detailed description of the process is given but not the name of the "oil-producing seeds." "According to Schädler, this communication of Eckeberg's fills up a gap in the historical record of oil mills, nothing new having been recorded between the time of the Romans [by Pliny] and the sixteenth century." "The invention of the hydraulic press in 1795 marked an important advance in the oil industry. In 1815 these new presses were introduced into France and Germany, where they rapidly spread and are still in use in the majority of oil works... At first only vertical hydraulic presses were made, but later on the horizontal form was introduced; nevertheless, the vertical shape is still the most widely used."

A long and interesting table (p. 24-31) titled "Table of vegetable fats and oils, with French and German nomenclature, source and origin, and percentage of fat in the plants from which they are derived" contains the following six columns: English names. German names. French names. Plants from which obtained. Country of origin (incl. Oceania). Percentage of fat and oil in the seeds. The 148 oils are listed alphabetically by their French name.

The majority of the English-language names are no longer familiar, such as: Cashew apple, prickly poppy, ailanto, anda, tucum, apple kernel, cardon, galam, candlenuts (Origin: Oceania), ben, pear kernel, dika, Java almond, nettleseeds, niam, ramtil, ochoco, ocuba, etc.

More common oils (with their names in three languages) are: Charlock / Ackersenf-Ravison / Ravison d'Odessa. Himalayan apricot / Aprikosenkern / Amandes de l'abricot. Alligator pear / Avocado / Abacetier, Avocatier. Earthnut, Peanut / Erdnuss, Madrasnusse, Mandobi / Arachide, Pistache de terre (Origin: West Africa, India). Hempseed / Hanf / Graines de chanvre. German sesame, camelina / Leindotter / Cameline. Almond / Mandel / Amandes. Palm / Palm / Palme. Palm kernel / Palmkern / Palmish. Rapeseed / Raps / Navette. Rubsen seed / Rübsen / Navet (turneps [sic, turnips]). Sesame, till, benné / Sesam / Sesame, grinding

In the chapter on "Non-drying vegetable oils (p. 107-69) are long sections about: Cyperus oil (Cyperus grass oil; *Erdmandelöl, Huile de souchet comestible).* Ground nut (Earth nut), arachis, or pea nut oil *(Erdnussöl, Arachidöl, Arachisöl, Mandoböl; huile d'Arachide, huile de pistache de terre).* Almond oil. Sesame oil (Gingely or Jinjilli oil), benné oil, til or teel oil. Soja bean oil (p. 166-67).

Concerning Soja bean oil: The raw material has many names: "Chinese oil bean, Sao, Soja bean, the fruit of Dolichos Soja L. = Soja japonica, Soja hispida, indigenous to China and Japan. The seeds, which are edible and possess a piquant flavor, contain soja bean oil, falsely designated 'huile de pois,' an oil used for alimental [alimentary] purposes." A table, based on Meissl and Böcker, shows that the beans contain 30% soluble casein, 18% fat, 0.5% albumen, 7% insoluble casein, 2% cholesterin, lecithin, resin and wax, and 10% dextrin. The author does not know how this oil is prepared, but "it is probably obtained by pressing in the ordinary way." "Properties.–There is no information available on this score."

The chapter titled "Apparatus for grinding oil seeds and fruits" (p. 42-107) includes many detailed descriptions and excellent illustrations including: Edge runner mill (Anglo-American, p. 46-47). Crushing roller mill (p. 48). Seed crusher (p. 49). Seed crusher (Anglo-American, p. 49). Roller mill (Krupp, p. 51). Improved heating pan (p. 54-55). Wedge press (p. 58-59). Hydraulic press (p. 59-61). Pan presses (p. 61-64). Cake moulding machines (p. 64-66). Hydraulic press for round cakes (p. 68).

In the section on "Improved export presses" (p. 77) is an illustration of an hydraulic press (manufactured by Rose, Downs & Thompson of Hull, England) with movable box which is "suitable for treating linseed, rape, sunflower, gingelly, sesame, mustard, poppy and niger seeds, decorticated and undecorticated cotton-seed. Chinese peas [soja beans], castor oil beans,... ground nuts, coprah,... palm kernels and olives." etc. Note 1. This is the earliest English-language document seen (Sept. 2003) that discusses the hydraulic press in connection with soy beans. It is also the earliest English-language document seen (Sept. 2003) that contains the term "hydraulic press" in connection with soy beans.

"The universal extractor" (illustrated, p. 96-97) of J.G. Lindner & Merz, is designed to extract oil or fat from all fatty materials, including flax, hemp, sesame, ground nuts, pressed oilcake, etc.

In the chapter on "Vegetable drying oils" is a long section about Hempseed oil (p. 172-73). In the chapter titled "Oil-cake and oil-meal" is a table (p. 291) which gives the composition of the 16 "most important oil-cakes." Linseed cake and meal, ground nut cake (both undecorticated and decorticated) and sesame cake are listed; soja bean cake is not.

On page 299 is a "Table of constants of [39] oils and fats," including: Apricot kernel, arachis oil, hemp oil, almond oil, rape oil (Raps), Rape oil *(Rüböl)*, sesame oil, whale oil. Soja oil is not mentioned. For each oil is given: Specific gravity at 15ºC. Saponification value. Iodine value. Hehner number. Reichert number. Acid number. Acetyl.

Note: This is the earliest English-language document seen (Feb. 2003) that uses the term "acid number" in connection with soybean oil

Early history of oil milling (p. 2-7): Pliny [of Rome, AD 23-79] gave the earliest known description of an oil mill, which the Romans called a "turpetum," that crushed olives. In 1767 the Swedish Captain Eckeberg gave a detailed description of oil milling in China. In 1795, the invention of the hydraulic press marked an important advance. In 1815 these new presses were introduced into France and Germany.

The section titled "'Extraction' method of obtaining oils and fats" (p. 88-107) discusses the use of solvents such as carbon bisulphide, canadol, benzol, benzine, sulphuric ether, or carbon tetrachloride. Many specific commercial systems are described and illustrated including: Diess's extracting apparatus, Voohl's extractor, Seiffert's battery of extractors, and the Excelsior extractor (Wegelin & Hübner of Halle, Germany). Also discusses: Oil-extraction installations (building designs), press moulds and plates, and machine for trimming oil-cakes. Soy is not mentioned in connection with any solvent extraction equipment.

Louis Edgar Andés lived 1848-1925. Note 2. This is the earliest English-language document seen (July 2000) that contains the word "Oceania."

133. Lindley-Cowen. L. Western Australia Bureau of Agriculture. ed. 1897. The West Australian settler's guide and farmer's handbook: Descriptive notes on the agricultural areas and crown lands open for selection... Perth, Australia: Bureau of Agriculture. E.S. Wigg & Son, Printers. 22 + 818 + 23 p. Issued in 6 parts. See Part 1, p. 447-48. Edited by L. Lindley-Cowen, Secretary.
• ***Summary:*** Chapter 3, titled "Fodder and forage plants (Exclusive of grasses)" begins: "The bulk of the information given in the following pages is taken from Bulletin No. 2, issued by the United States Department of Agriculture, division of agrostology. Numerous other plants are mentioned in the bulletin, but only those have been selected which it is considered might be successfully introduced into this colony."

In this chapter (which is mostly about legumes, with the plants listed alphabetically by scientific name) is a subsection (p. 447-48) on the soja bean. It starts with a large illustration (line drawing), "Fig. 11.- Soja bean *(Glycin [sic, Glycine] hispida)* which shows the upper part of a soybean plant with leaves, pods, and a flower.

It continues: "*Glycine hispida* (Soja bean; soy bean; coffee bean. Fig. 11)–An erect annual legume, with hairy stems and leaves, which has been cultivated in China and Japan from remote antiquity. It was long grown in botanic gardens, but when the facts concerning its use as a human food by oriental nations came to light about twenty years ago, it was largely introduced into this country [USA] and Europe, where thorough trials of its forage and food value have been made. There are a large number of named varieties, which vary in the color of their seeds and the length of time which the plants require to come to maturity. The seed is planted at the rate of half a bushel to the acre, in drills 2½ to 3 feet apart, and cultivated about the same as Indian corn. In Virginia, soja beans are planted between the hills of corn, so that two crops are produced on the same field at the same time. The yields of seed are often enormous. Soja beans are fed to stock green, as silage, or as hay. The haulms are rather woody, and do not make the best quality of hay, but as either ensilage or green forage they are unsurpassed. The hay contains from 14 to 15 per cent. crude protein and 3 to 6 per cent. of fat. The beans contain from 32 to 42 per cent. protein, and from 12 to 21 per cent. of fat in fresh material. When fed to milch cows, a ration of soja beans increases the yield of milk, improves the quantity of the butter, and causes the animal to gain rapidly in weight. It is an excellent addition to a ration for fattening cattle. In China and Japan, where the soja bean is an article of diet, substances similar to butter, oil, and cheese [tofu], as well as a variety of dishes, are prepared from it. The yield of green forage amounts to from 6 to 8 tons per acre, and of the beans from 40 to 100 bushels. The feeding value of the bean has been found to be greater than that of any other known forage plant except the peanut."

Also mentioned in this chapter are the peanut (p. 433), astragalus (p. 434), *Brassica napus* (winter rape, rape, dwarf Essex rape, p. 436-37), chick pea (p. 439), *Cyperus esculentus* (chufas, hognut, ground almond, p. 440), lentil (p. 440), etc. Address: Perth, Australia.

134. *Otago Witness (New Zealand)*.1898. A Chinese dinner in New York. Jan. 6. p. 52.
• ***Summary:*** "A Chinese dinner is the most civilised dinner in the world." The feast began at 2 o'clock and there were ivory chopsticks at every diner's place–and never a knife or fork in sight. There were many courses. "The shark-fin rolls, in spite of their forbidding name, were a gelatinous mixture rolled in eggs, very light and digestible, but needing the relish of the red 'soy' sauce into which one was expected to dip them."

"The stuffed chicken wings were a marvel of delicacy, but the addition of 'soy' obscured their distinctive flavour to any but a Chinese palate subtilised by a thousand years of discrimination."

135. *Otago Witness (New Zealand)*.1898. Farm notes: A new fodder plant–The soja bean. Jan. 13. p. 7.
• ***Summary:*** From *The Australasian:* "The fodder plant that has attracted more attention than any other among the farmers of the United States during the last few years is the soja bean. It has not advanced into public notice as the result of any boom, but is rapidly coming into the foremost

place purely on its merits. It has been principally grown in what is known as the 'corn belt,' sometimes with maize but often as a single crop. It thrives on the uplands, but naturally gives heavier yields on the rich river flats. What should make this fodder plant worthy of the attention of Australian agriculturists is the fact that it withstands droughts admirably, and yields a fair crop even in a very dry time when the maize proves a failure.

"According to reports, the soja bean is most valuable for feeding off stock on the ground, one practice being to fatten cattle, sheep, or pigs on them when the maize cobs have been harvested. Owing to the large amount of oil it contains the soja bean is extremely fattening, while the plant is regarded as equal to clover hay in feeding quality. The testimony of farmers and experimental stations is so greatly in favor of this plant that it should be worthy of trial at the hands of Australian farmers. The evidence given on this plant points to its being a most valuable fodder for dairy stock.

"Mr. R.Y. Gaines, of Virginia, says:–'In 1884-85 and 1886 I made experiments that demonstrated the adaptability of the soja bean to our soil and climate, as well as its inestimable value as a food product, What was then pronounced by many as Utopian and chimerical are now demonstrated facts.' He says it as entirely owing to the cultivation of the soja bean that he was able to keep his head above water in these hard times. The Massachusetts Experiment Station, in reporting on the feeding quality of the soja bean, says:–"They are probably the richest known vegetable substance... A hundred pounds of shelled corn contains 4.5 lb of fat. A hundred pounds of soja beans contains 18.9 lb of fat. They require less labor to cultivate than corn, will make more feed on poor land, and on rich land will treble the feed value of corn.'

"Mr. J. Beetwood, writing to 'Swine Husbandry,' says: 'I have threshed over 100 bushels of soja beans from one acre of rich river flat. It is the best feed for hogs we know of, making the firmest and fattest pork.'

"Mr. E.S. Wilson, of Illinois, writing to 'Coleman's Rural World,' says:–'It is certainly a grand forage plant. I have known it to stand in water for three weeks and yet come out and make a good crop. This season, with the weeks of drouth and high temperature, every bush was full of beans, the feeding value of which is rated the same as cotton seed. Its threshed straw in Herbert Myrick's feeding chart is rated as high as clover hay, and a crop on good land will make two tons of straw per acre.' On land that has been cropped for half a century it has yielded 26,650 lb of green fodder per acre cut for silo.

"Mr. Morris, of Illinois, writing to 'Coleman's Rural World,' says:–'Owing to the large amount of oil it contains it is slow curing and must be thoroughly cured to keep. For forage I cut as soon as the leaves begin to fade; when the beans are dry store in barn.' There are several varieties of the bean in cultivation, the best known being the mammoth [Mammoth] and the dwarf. Mr. Morris gives the following directions for harvesting the crop:- 'The dwarf beans must be cut with a corn knife. Take a stick 20 in long in the left hand, with it bend the plant to the left, and cut the plant at the surface of the ground with the knife. To harvest the larger varieties, if for feed, let the leaves begin to turn yellow at the bottom of the plants, and cut with a mowing machine or table rake. Let them stand for a day or two, then bunch into small cocks. After four or five days bunch into larger cocks, and let stand until the beans get dry in the pods. It will take 10 days. To cut for a seed crop, let stand until the leaves all turn yellow. The seed crop must be carefully dried before putting into bulk, as heat would endanger the vitality of the beans. The plant is extremely hardy, and is said to be able to hold its own against flood, frost, drought, grass, and weeds. Curiously enough, the soja bean was cultivated in America in small quantities for many years before its value as a fodder plant was discovered.

"In Victoria [Australia] soja beans have been cultivated on a very small scale for the last 10 or a dozen years [i.e., since about 1888 or 1886], but never on a scale to test its value as a fodder plant. A few farmers in Gippsland [a rural region in Victoria, Australia, stretching just east of Melbourne to the New South Wales border] cultivate it for supplying seed to the Melbourne seed houses, but the demand is extremely small. The soja bean is small, scarcely half the size of the smallest pea [sic] in cultivation. It is smooth-skinned and not nearly as hard as the English horse-bean."

136. *Ashburton Guardian (Canterbury, New Zealand)*.1898. Magna est veritas et prævalebit: Local and general. Feb. 10. p. 2.

• ***Summary:*** "Of the thousands of Chinese residing in 'Frisco' [San Francisco], the great majority have a decided aversion to what they call 'white devils' bread,' preferring articles all the way from China, or such products as can be raised in the alluvial valleys of California. In the stores of Chinatown, San Francisco, are to be seen, large baskets of yellowish-white lily bulbs... Among other articles frequently met with in the provision stores of Chinatown are:–... Chinese cabbage, Brassica chinensis; sprouted seeds of the Soy bean, Glycine Soja; black, white, and green seeds of Glycine Soja, and a small, square, white cheese made from the same, wrapped in a yellow cloth, and bearing a brown Chinese monogram;..."

Note 1. This article is a paraphrase of an article published about 3 months earlier, on 20 Nov. 1897, in the *Sydney Mail* (Australia) (p. 2).

Note 2. The phrase *Magna est veritas et prævalebit* [Truth is great and will prevail] comes from the King James version of the Old Testament.

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137. *Southland Times (Otago, New Zealand).* 1898. Soja bean. March 26. p. 6.

• ***Summary:*** "Glycine hispida (Soja bean; soy bean; coffee bean). It is an erect annual legume with hairy stems and leaves, which has been cultivated in China and Japan from remote antiquity. It was long grown in botanic gardens, but when the facts concerning its use as a human food by oriental nations came to light about twenty years ago it was largely introduced into this country [USA] and Europe, where thorough trials of its forage and food value have been made. There are a large number of named varieties which vary in the color of their seeds and the length of time which the plants require to come to maturity.

"The seed is planted at the rate of half a bushel to the acre, in drills 2½ to 3 feet apart, and cultivated about the same as Indian corn. In Virginia soja beans are planted between the hills of corn, so that two crops are produced on the same field at the same time. The yields of seed are often enormous. Soja beans are fed to stock green, as silage, or as hay. The haulms are rather woody, and do not make the best quality of hay, but as either ensilage or green forage they are unsurpassed. The hay contains from 14 to 15 per cent crude protein and 3 to 6 per cent of fat. The beans contain from 32 to 42 per cent protein, and from 12 to 21 per cent of fat in fresh material. When fed to milch cows a ration of soja beans increases the yield of milk, improves the quality of the butter, and causes the animal to gain rapidly in weight. It is an excellent addition to a ration for fattening cattle.

"In China and Japan, where the soja bean is an article of diet, substances similar to butter, oil, and cheese [tofu], as well as a variety of dishes, are prepared from it. The yield of green forage amounts to from 6 to 8 tons per acre, and of the beans from 40 to 100 bushels. The feeding value of the bean has been found to be greater than that of any other known forage plant except the peanut."

138. Valder, George. 1898. Notes for Hawkesbury District. *Agricultural Gazette of New South Wales* 9(8):939-41. Aug.

• ***Summary:*** The section titled "Leguminous crops" states: "Cow peas, Lima beans, soy beans and other leguminous crops suitable for the warm season should be sown at the end of this month."

Note 1. The Hawkesbury District is just north of Sydney, NSW, Australia. Richmond is a town near Sydney, located on the alluvial Hawkesbury River flats at the foot of the Blue Mountains. Hawkesbury Agricultural College was established in Richmond, in 1891 as the first agricultural college in New South Wales. In 1989 the college was incorporated into the University of Western Sydney.

Note 2. An asterisk after the title of this article states: "The directions herein given will apply to the greater portion of the Central and South Coast Districts."

139. Valder, George. 1898. Farm notes for Hawkesbury District. *Agricultural Gazette of New South Wales* 9(9):1055-58. Sept.

• ***Summary:*** The section titled "Leguminous forage crops" states: "It is very necessary that more attention should be given to these crops if the farmer wishes to keep up the fertility of his soil." After a brief discussion of horse-beans, sunflowers, cow-peas and lucerne, we read: "In the United States the soy-bean has come largely into favour for this purpose [as a forage crop]. Although, so far, it has yielded rather uncertain crops in this Colony, I believe that we shall discover one or two suitable varieties among the large number under cultivation. Being an upright grower, it can be cut for forage with a mowing machine, and is easily harvested in every way, besides chaffing well" [it can be cut up fine for the food of cattle].

140. Valder, George. 1898. Farm notes for Hawkesbury District. *Agricultural Gazette of New South Wales* 9(10):1227-29. Oct.

• ***Summary:*** The section titled "Leguminous forage crops" begins: "Cow-peas, Soy Beans, &c., can still be sown." Also discusses the Florida Velvet Bean, and pea-nuts for feeding to pigs.

141. *Sydney Mail (Australia).* 1899. The best silage crops. May 27. p. 1209.

• ***Summary:*** From Orange Judd Farmer: "The principal crops available for silage are corn, clover, oats, and peas, millet and soy beans. Corn is the leading silage crop of America..."

"The soy bean is another Japanese crop. The large green variety has proved most valuable for use in the silo, or for feeding green. It will produce from 10 to 12 tons of fodder, and has a composition much like clover. The crop is quite hardy. The plant resembles a large bush bean, grows about 4 feet high, produces a stiff, woody stem, and has a large proportion of foliage. One advantage of this crop is that it matures about the same time as corn. This permits the harvesting and storing of the two crops together. By putting into the silo a few loads of each in succession, a good mixture is obtained, and the resulting silage is more valuable than that from corn alone. Corn silage is especially lacking in the muscle-making constituents of protein, while the soy bean supplies more of this nutrient, and hence the mixture gives a better balanced ration."

142. *Bay of Plenty Times (New Zealand).* 1899. A new fodder plant. Sept. 1. p. 4.

• ***Summary:*** "The soy bean (Soja hispida) is one of the comparatively new fodder plants that is not yet sufficiently appreciated (says the 'American Agriculturist.') It is a leguminous, or clover-like plant, which seems to possess great facility for getting its nitrogen from the air, owing to the nitrogen nodules in its roots. The dry matter in either the green fodder or straw of the soy bean contains twice as much fat and protein as in fodder corn, while the grain is hardly exceeded in richness by cottonseed meal. Indeed, it is probably true that 'these beans are the richest known vegetable substance,' and as they can be raised in any climate or soil that will mature corn, this crop enables the northern farmer to raise concentrated feed instead of buying it.

"The beans can be ground in country mills, and the meal is superior in food value for milk production to cottonseed meal. If roasted and ground these beans may be used as a substitute for coffee. The flavour is not like that of coffee, but it is agreeable, and the drink is wholesome. This last is specially true of the early white [Early White] variety, which is too small in growth to make a satisfactory fodder plant, but yields 16 to 20 bushels of seed per acre. The medium green [Medium Green] variety is best for forage, growing about 3 ft high, and is leafy and succulent. It is well liked by cattle. In fairly fertile soil it will produce 10 to 12 tons green fodder per acre. It should be sown in drills 2½ ft apart, using 1 to 1¼ bushels of seed per acre. Sow about corn-planting time, and cultivate freely early in the season. It will produce a valuable fodder, to be fed green or put into the silo in the proportion of one part soy bean to two parts of corn.

"Such silage is a balanced feed for milch cows, and much richer in nitrogenous or flesh-forming elements and in fat than corn silage. The black [Black] variety is a good fodder plant, but not equal to the green [Green]. Both kinds will ripen seed wherever the larger kinds of corn mature. Owing to the wonderful root development of the medium green [Medium Green] variety, it has an admirable effect on the soil when the stubble is ploughed under."

143. Valder, George. 1899. Hawkesbury District–September. *Agricultural Gazette of New South Wales* 10(9):967-70. Sept.
• ***Summary:*** The section titled "Leguminous crops" begins: "Cow-peas, Lima-beans, Soy-beans, and other leguminous crops suitable for the warm season should be sown at the end of this month." Lucerne and pea-nuts (for fattening pigs) are also mentioned.

144. Valder, George. 1899. Hawkesbury District–October. *Agricultural Gazette of New South Wales* 10(10):1128-31. Oct.
• ***Summary:*** In the section titled "Leguminous forage crops," the soy-related text is identical to that in the Sept. 1898 issue.

145. Valder, George. 1899. Hawkesbury District–November. *Agricultural Gazette of New South Wales* 10(11):1218-21. Nov.
• ***Summary:*** The section titled "Leguminous forage crops" begins: "Cow-peas, Soy Beans, &c., can still be sown." Also discusses cow-peas, Florida Velvet Beans, and pea-nuts (for feeding to pigs).

146. MacMahon, Philip. 1900. Horticultural notes. *Queensland Agricultural Journal* 6(3):240-50 March. See p. 241.
• ***Summary:*** In the first section, titled "Vegetables," is the following entry (p. 241). "The Soja Bean *(Soja d'Etampes)*, which grows to a height of about 20 inches, is a most useful vegetable." Address: Curator, Botanic Gardens, Brisbane [Australia].

147. *Otago Witness (New Zealand).* 1900. The crisis in China. June 28, p. 67.
• ***Summary:*** The section titled "Tongsgan" [Tongxian, T'ung-hsien] states that in this city near Pekin [Peking, Beijing] there are railway workshops employing 1,000 people, and a coal mine with an average output of 2,000 tons a day.

"It would seem that the grain, cattle, horses, iron, coal, [soya] beans, [soya] bean cake, [soya] bean oil, skins, gold, pigs' bristles, wild raw silk, and so on, will be of very material advantage to Russia in the event of the Powers dividing China into spheres of influence."

Note: Tongshan is a city in China, 12 miles east of Beijing, on the Bai River.

148. *Agricultural Gazette of New South Wales.* 1900. General notes. 11(9):812-15. Sept.
• ***Summary:*** The section titled "The soy bean as a forage crop" states: "Some years ago Mr. Geo. Valder, who was then manager of the Wagga Experiment Farm, conducted a number of experiments to determine the value of the Soy (or Soja) bean for culinary and fodder purposes. The opinion formed on the trials was that for a hot-weather grower it was hard to excel the Soy bean, which produced an abundance of foliage and pulse. Seed was also sent to farmers in various parts of the Colony, and in one place–Rylstone [see Dec. 1893 issue]–This bean produced a wonderful crop during the hottest and driest months of the year.

"In the [United] States, where pulse crops for forage receive a good deal more attention than is the case here, the Soy bean is recognized as a valuable and reliable crop for seasons of drought. Speaking of it in the *American Agriculturist*, Professor Thomas Shaw, of Minnesota, which is just as subject to prolonged spells of hot, dry weather as our western districts, says: -

"The soy bean may be grown for the grain, for soiling food, for ensilage, for pasture, and for green manuring. Its greatest value, however, will probably be found in furnishing soiling food for dairy cows, as it is in the proper condition for being thus fed at that season of the year when but few plants are available for such use; that is to say, during the latter part of the summer. The Soy bean is a hot-weather plant, and is able to stand more drought than the cow-pea. When once well-rooted, hot winds that would wilt and wither many other forms of vegetation will not seriously injure the Soy bean.

"In appearance it resembles a common bean, but the foliage is larger and much more luxuriant, and the habit of growth is more upright. With all the conditions favourable, this plant in some of its varieties will grow to the height of at least 4 feet, and it produces a large yield of green food. Some of the early varieties, as the medium or green, can be grown successfully further north than the cow-pea. The claim, however, that they will flourish as far north as corn is not quite correct. And since it will stand drought better than the cow-pea, it has special adaptation for districts subject to scanty rainfall. Its province as a catch crop is more circumscribed than that of the cow-pea, since in many of its varieties it takes longer to mature. Nevertheless, there are many crops which it may be made to follow the same season, as, for instance, winter rye, winter wheat, grain forage eaten down, or an early crop of potatoes. A warm, rich vegetable soil with a porous subsoil is best adapted to the growth of the Soy bean. The soils of the fertile prairie, therefore, are a natural home for it. On poor, sandy soils it will not make a large growth unless these are first fertilised.

"The preparation of the soil should be such as to make a deep, fine, firm and moist seed-bed. When the Soy bean is planted after a grain crop which has just matured, a free use of the harrow and roller should be made in a normal season to conserve moisture. When sown from the grain, for ensilage, for soiling food, or for hay, the seeds are put in with the grain drill. But they may also be planted with a corn-planter or a bean-planter. It is customary to make the rows about 30 inches apart. If the crop were grown for pasture, the rows could be made considerably closer, under some conditions, but not so close as to preclude cultivation, except such as may be given with the harrow. When the rows are 30 inches apart, from 2 to 4 pecks of seed will suffice per acre. At no time should the seed be sown earlier than the corn-planting season, and in districts subject to late frosts it ought to be planted later. In the cooler districts, earlier varieties only should be sown, and even in the hotter localities very late varieties ought not to be used.

"In cultivation, a harrow with the teeth aslant can be used with advantages before the beans are up, and also in some instances at a later period. The cultivation should be prompt and generous, more especially when the plants are young. For making hay the Soy bean should be cut when the beans in the pod are fully half-grown, or before the lower leaves begin to fall freely, and the aim should be to handle it but little during the curing process, lest many of the leaves should be lost. When mixed with corn in the silo, the quality of the ensilage is thereby considerably improved."

Note: This article was reprinted under the same title in *The Sydney Mail* (8 Sept. 1900, p. 7); the source was not cited

149. Valder, George. 1900. Hawkesbury District–September. *Agricultural Gazette of New South Wales* 11(9):801-04. Sept.

• ***Summary:*** The section titled "Leguminous crops" begins: "Cow-peas, Lima-beans, Soy-beans, and other leguminous crops suitable for the warm season should be sown at the end of this month." Also mentions lucerne and pea-nuts.

150. *North Otago Times (New Zealand).*1900. The industries of Japan. Oct. 13. p. 2 (Supplement).

• ***Summary:*** "Agriculture is the chief pursuit of the people of Japan, and in the greater part of the cultivated area rice and the principal food crops, wheat, barley, and soya beans, are grown."

"The industries of the Japanese empire may be distinguished as 'original' and 'imported.' The original industries which existed from early times are those of... vegetable wax, salt, sugar, sake, soy [sauce], oil, tobacco, indigo, and raw silk."

151. Valder, George. 1900. Hawkesbury District–October. *Agricultural Gazette of New South Wales* 11(10):909-12. Oct.

• ***Summary:*** In the section titled "Leguminous forage crops," the soy-related text is identical to that in the Sept. 1898 issue.

152. Bailey, Liberty H. 1900-1903. Cyclopedia of American horticulture. 2nd ed. 4 vols. New York, NY: The Macmillan Co.; London: Macmillan & Co., Ltd. See vol. 1, p. 136-37. Vol. 2, p. 653. Vol. 4, p. 1693. Assisted by Wilhelm Miller, Assoc. Editor.

• ***Summary:*** This classic is illustrated with over 2,000 original engravings, including two of the soy bean. Full-sized illustrations (fig. 191; p. 136) in Volume 1, under "Bean," show the seeds of 6 types of beans, including four seeds of *Glycine hispida* (the soy bean). Another illustration (fig. 195; p. 137) shows the leaves and pods of the Soy Bean–Glycine hispida (one-third size), and the accompanying text states: "Of greater value [than the Cow-pea] for the same purposes, north of New Jersey, seems to be the Japanese Soy Bean, which is early enough to come to maturity almost anywhere in the United States. Its foliage is rather thin or open, however, which impairs its value for green-manuring. The dry Bean constitutes one of the richest vegetable foods known, and its flavor seems unobjectionable to all kinds of stock. Sow 1 bushel to the acre."

Volume 2, p. 653 notes: "Glycine (Greek for Sweet). Leguminosae. Perhaps 15 or 20 species in tropical Asia, Africa, and Australia, mostly twining vines. The Glycines are allied to Dolichos, Vigna and Phaseolus: The cultivated species are distinguished by small and hairy flowers in short axillary racemes... In this country Glycine is known only in the Soy Bean, G. Hispida, Maxim. (fig. 195; p. 137), which is an erect, hairy annual from Japan and China. It is also known as the Soja Bean, Coffee Bean and Coffee Berry... In China and Japan the seeds are much used for human food, but in this country the plant is grown for forage, having begun to attract attention about 25 years ago. The beans may be used as a substitute for coffee; and for this purpose the plant is often sold. The Soy Bean, in the form in which we know it, seems to be unknown in a wild state. It is probably a domesticated form of Glycine Soja, Sieb. & Zucc., which is wild in Japan. These two species are united by some authors and separated by others (see Franch. & Sav. Fl. Jap. 1:108. Maxim. Bull Acad. St. Petersb. 18:398). For purposes of perspicuity and definition, they may well be kept separate in the books... Glycine was once applied to Wistaria. It is sometimes used for that genus at the present day in foreign lists (L.H.B.)"

Vol. 4, p. 1693 states: "Soy Bean *(Glycine hispida,* which see for botanical description) is a legume, and while it has long been a staple crop in Japan it has but somewhat recently been cultivated in the United States. Figs. 191, 195. It grows to perfection only in a tropical or semitropical climate. In its native country, Japan, the seed is an important human food product, but in the United States its principal use at present is as a forage plant for farm live stock and as a soil renovator...

"To the horticulturist the Soy Bean is valuable chiefly as a soil renovator... When the soil is so hard and forbidding that clover will not thrive the Soy Bean may be made to serve as a nitrogen gatherer, and when plowed under it serves to greatly improve the physical condition of the land. See also *Glycine* (L.A. Clinton)." Address: Prof. of Horticulture, Cornell Univ., New York.

153. Banks, Joseph; Solander, Daniel. 1900. Illustrations of the botany of Captain Cook's voyage round the world in the H.M.S. *Endeavour* in 1768-71. 3 vols. London: British Museum (Natural History). See vol. 1, p. 22. 50 cm. • ***Summary:*** In Vol. 1 of this large-format folio book, under Australian Plants, large and beautiful illustrations (p. 22) depict *Glycine tabacina* Benth. and *Glycine tomentosa* Benth., which are wild perennial relatives of the soybean. The illustrations are based on herbarium specimens (collected by Banks and Solander) in the British Museum.

At the description of *Glycine tabacina* is written: *"Benth. Fl. Austral. ii 245 (1864).* There is no description of this in Solander's MSS. The specimens are from Botany Bay, Bustard Bay, and Bay of Inlets." Note that this reference is to *Flora Australiensis: A description of the plants of the Australian Territory,* by George Bentham. Vol. II, p. 245. Bentham first named is species in 1864. Botany Bay is on the southern border of the city of Sydney, New South Wales. It was the scene of the first landing on Australian soil by Captain Cook in April 1770. Bustard Bay is in Queensland, just north of Bundaberg. Bay of Inlets is in Queensland, just south of Mackay.

At the description of *Glycine tomentosa* is written: *"Benth. Fl. Austral. ii 245 (1864)."* There is then a long botanical description of the plant in Latin. It is not clear who wrote this description, since Bentham's 1864 description is in English. Finally the place of collection is given as "Endeavor's River." Note that this plant, also, was collected in 1770. The Endeavour River (note spelling) still runs through Cooktown in northern in Queensland.

Note 1. This work was first cited in Oct. 1994 in a personal communication from Prof. Ted Hymowitz of the University of Illinois. In about 1986-87 he and two colleagues (Tony Brown and Jim Grace) walked up and down the knoll near Cooktown looking for wild relatives of the soybean. There is a motel now on top of the knoll. Prof. Hymowitz has also seen the herbarium specimen of *Glycine* from the voyage; it is now in the British Museum.

Note 2. This book is part of a 3-volume set. Volumes 1 and 2 have the same title, as shown above. Vol. 3 has the title: *Illustrations of Australian plants collected in 1770 during Captain Cook's voyage round the world in the H.M.S. Endeavor.*

Note 3. If we take the date of collection (1770) rather than the date of publication (1900) as being the date the of document, this would be the earliest document seen concerning soybeans (but only wild perennial relatives of soybeans) in Australia or Oceania; cultivated soybeans had not yet been reported by 1770.

Note 4. The first author, Joseph Banks, lived 1743-1820. So he had been dead for 80 years when the book was published. Daniel Solander, lived 1733-1782, was even younger.

Note 5. The Bay of Inlets no longer exists on most maps of Australia. It includes Shoal Water Bay and Broad Sound which are both on the Queensland coast just south of Mackay (pronounced muh-KAI). The area is now known as Broad Sound Channel, which leads into Shoal Water Bay and Broad Sound. Sources: (1) *An Account of a Voyage Round the World, with a Full Account of the Voyage of the Endeavor in the Year MDCCLXX Along the East Coast of Australia by Lieutenant James Cook...* Compiled by D. Warrington Evans. Brisbane: W.R. Smith & Paterson (1969). This book includes a chart (facing page 8) of New South Wales on the east coast of New Holland by James Cook, 1770. The Bay of Inlets is on this map. (2) *Reader's Digest Atlas of Australia.* Sydney: Reader's Digest. 1977. Maps 13 and 22 include the area concerned.

Note 6. Solander, a botanist, was one of Linnaeus' favorite students and one of the many he sent to various distant places around the world to collect plants unknown to Europeans.

Note 7. "Only the lack of an M.D. degree has kept the greatest explorer of all times from also being recognized as the world's first practicing nutritionist." He conquered scurvy on his ships.

154. Jevons, Alice. 1900. Dishes without meat: Original recipes. Sydney, Australia: Angus & Robertson. 45 p. 19 cm. *
• ***Summary:*** Available in London from: The Australian Book Company, 38 West Smithfield, London, E.C.

155. Burkill, I.H. 1901. The flora of Vavau, one of the Tonga Islands; with a short account of its vegetation by Charles Steele Crosby. *J. of the Linnean Society of London, Botany* 35(242):20-65. See p. 34. April 1. [1 ref]
• ***Summary:*** "Glycine tabacina, Benth. Fl. Austral. ii. p. 244. Fiji; westward to the New Hebrides and New Caledonia; and to Tropical Asia."

Note 1. This is the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in New Hebrides (later Vanuatu); cultivated soybeans have not yet been reported.

Note 2. This is the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in the Kingdom of Tonga; cultivated soybeans have not yet been reported.

156. Valder, George. 1901. Report of the principal, Hawkesbury Agricultural College. *Agricultural Gazette of New South Wales* 12(8):953-92. Aug.
• ***Summary:*** This is the college's 9th annual report. The section titled "Legumes" (p. 967-68) gives short descriptions of the many legumes (most with a scientific name) that were tested and the test results: Tree lucerne *(Cytisus proliferous).* Gorse, or furze *(Ulex Europaeus).* Lupins *(L. albus, L. luteus).* Blue lupins *(L. varius).* Crimson clover *(Trifolium incarnatum).* Red clover, white clover *(Trifolium pratense, T. repens).* Japan clover *(Lespedeza striata).* Bokhara clover *(Melilotus alba).* Black tares and Golden tares. Asparagus pea, or Square-podded pea *(Lotus tetragonolobus.* Seeds obtained from the United States). Pigeon pea *(Cajanus indicus).* Cow-peas *(Vigna Catiang).* White perennial cow-pea. Florida Velvet Bean. Madagascar Bean.

Note: This is the earliest English-language document seen (Aug. 2007) that uses the term "Asparagus pea" to refer to the winged bean.

"The following [beans] have also been sown:–Soy, Broad, Horse, Haricot, Madagascar, Poor Man's, Small Mauritius, Horticultural Lima, Black Pole Lima, Sultan's Best of All, Japanese Lima, Snake and Green Mung, and Castor-oil beans, as well as Peanut, Chickpea, Sainfoin, and Serradella."

The "cow-pea, though extremely valuable as a fodder plant and a nitrogen gatherer, has one drawback, its luxuriant growth and trailing habit, which make it extremely difficult to harvest with our present machinery..."

157. *Otago Witness (New Zealand).* 1901. Notes on rural topics: The soja bean. Sept. 18. p. 8.
• ***Summary:*** From *Agricola:* "The soja bean is a fodder plant that is thought very highly of in Canada and the United States, where it has been in cultivation for about five to seven years [sic, 135 years]. This leguminous fodder plant is a native of China and Japan, and though I have not seen it growing I gather from various reports that it has many good points to recommend it. Mr. Kinsella referred to it recently in his paper upon ensilage, and mentioned it as one of the substitutes for maize when a heavy green crop is desired in a climate unsuitable for maize. It was said a year or two ago that the soja bean plant had gained much favor with farmers in America, not as the result of a boom, but entirely upon account of its merits, and it was strongly recommended a few years ago as a suitable crop for the dry climate of Australia, but I cannot say whether it has caught on there or not. So many flattering things have been said about it that one is inclined to think it may prove to be no better than some other wonderful plants that have been boomed with disastrous results.

"A few years ago the Massachusetts Experiment Station gave the bean a trial, and reported it to be the richest known vegetable substance, being four times richer than maize corn. A hundred pounds of the latter contains 4½ lb of fat, while the same weight of soja beans contains nearly 19 lb of fat. An American farmer says that he has threshed 100 bushels per acre on a rich river flat. Another says it is certainly a grand forage plant, and withstands drought or excessive moisture. It is said to be well adapted for making ensilage, or silage, because it gives a heavy bulk of growth and being of such an oily nature is difficult to make into hay as it cures–that is, dries into hay, very slowly. It appears there are two varieties–the mammoth [Mammoth] and the dwarf [Dwarf]–and both are said to be so hardy as to be able to hold their own against flood, frosts, drought, grass and weeds. The bean itself is small, no larger than the vetch seed, smooth skinned, but not so hard as the horse bean. This bean, ground fine, is largely used in China and Japan in making the sauce called 'soy.'"

Note: This article is largely compiled from other articles previously published in New Zealand.

158. *Mercury (The) (Hobart, Tasmania, Australia).* 1901. Alterations in the tariff: Exemptions. Infants' and invalids' food. Nov. 30. p. 3.

• ***Summary:*** "Special preparations of... Van Abbott's prepared almond flour for diabetes, Soya flour for diabetes, etc."

159. Potts, H.W. 1902. Hawkesbury District farm notes–October. *Agricultural Gazette of New South Wales* 13(10):1042-44. Oct.
• ***Summary:*** The section titled "Cow-pea and Soy bean" begins: "These useful legumes are best sown in October... Cow-pea may be utilised as hay, and, further, it forms a valuable addition to maize for the silo, as also does the soy bean."

160. Potts, H.W. 1902. Hawkesbury Agricultural College and Experimental Farm: Catch crops for green fodder and conservation. *Agricultural Gazette of New South Wales* 13(12):1217-21. Dec.
• ***Summary:*** Last winter's crops failed in most districts, so the need for growing winter feed is now urgent. This article is mostly about millets, especially White French Millet. "Millets are a very good crop after clover, soy bean, or other legumes" (p. 1219).

161. Potts, H.W. 1902. Hawkesbury District farm notes–December. *Agricultural Gazette of New South Wales* 13(12):1227-28. Dec.
• ***Summary:*** The section titled "Cow-pea and Soy bean" begins: "These serviceable legumes should not be overlooked this month."

162. *Nelson Evening Mail (New Zealand).* 1903. Curiosities of smuggling. Sept. 18. p. 2.
• ***Summary:*** "England taxes... chutney because it contains sugar, soy sauce,..."

163. Froggatt, Walter W. 1903. Insectarium notes, and insects found about the Hawkesbury College. *Agricultural Gazette of New South Wales* 14(10):1019-27. Oct. 16. See p. 1022-24.
• ***Summary:*** The section titled "The soy bean moth *(Gelechia simplicella),* Walker" (p. 1023-24) states: "In October and November of last year, the Soy beans were infested with numbers of small caterpillars [of this moth] that not only fed upon the foliage but matted the leaves together with silken threads, so that the greater part of the crop was seriously damaged." Gives a detailed description of the caterpillars, cocoon, and moth.

An illustration (facing p. 1022) shows the soy bean moth (No. 6), *Gelechia simplicella, Walk.*

It is part of a larger, magnificent illustration titled "Some insect pests."

Address: F.L.S., Government Entomologist.

164. *Otago Witness (New Zealand).* 1903. Notes on rural topics: Agriculture in the Transvaal. Oct. 21. p. 7.
• ***Summary:*** "I have received through the editor of the Witness a copy of the *Agricultural Journal of the Transvaal* issued by the Agricultural Department of that country... The cow pea is mentioned favourably as being a suitable fodder plant for that region, and a plant called the Soy bean promises well from experimental trial made."

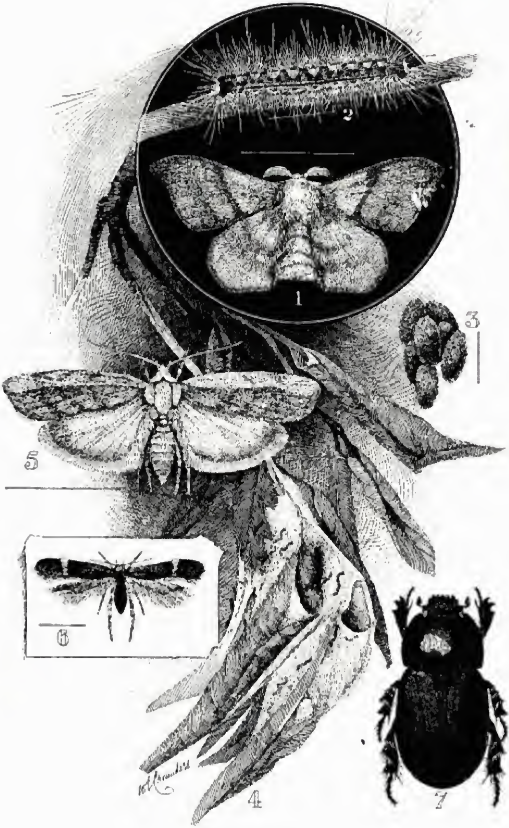
165. Potts, H.W. 1903. Hawkesbury District farm notes–November. *Agricultural Gazette of New South Wales* 14(11):1125-27. Nov. 12.
• ***Summary:*** The introduction notes: "Rust has appeared in most crops, but not in a severe form.

The section titled "Leguminous fodder plants" begins: "Cow-peas and soy beans may be sown throughout the month, both for catch crops as well as soil renovators. Soy bean is best grown as a cleansing crop, and possesses great powers to increase the nitrogen contents of the soil; and hence it is serviceable to prepare land for cereal crops to be sown in the autumn."

For "exhausted lands the cow-peas and soy beans are cheap and beneficial restorers of available plant food. Select early maturing varieties for this month."

166. Maiden, J.H. 1903. Flora of Norfolk Island. *Proceedings of the Linnean Society of New South Wales* 28(112):692-785. Sept/Nov. See p. 702.
• ***Summary:*** Under *Leguminosæ* (p. 702) is a one-line entry that reads: "29. Glycine tabacina, Benth.–New for the Island." Address: Govt. botanist for New South Wales and Director of the Botanic Gardens, Sydney.

167. Balland, A. 1903. Les principales légumineuses alimentaires des colonies françaises [The principal edible legumes of the French colonies]. *Annales d'Hygiene et de Medecine Coloniales* 50(3):193-206. Third Series. [1 ref. Fre]
• ***Summary:*** Contents: Peanuts *(Arachide* or *pistache de terre, Arachis hypogaea)* in Congo (samples were analyzed from Bahr-el-Ghazal [a former province of southwest Sudan–just east of the Central African Republic] and from Haut-Oubangui [later in the Central African Republic]),



SOME INSECT PESTS

Senegal, Guinea, Indochina [in today's Vietnam], Madagascar, New Caledonia.

Cajan *(Cajanus indicus)* in Guinea, French Guiana, New Caledonia, Réunion, Madagascar. Doliques *(Dolichos lablab, D. sinensis, D. uniflorus)* in French Guiana, Indochina, Cambodia, the Indies, Madagascar, New Caledonia, Réunion, Sudan. The Haricot bean *(Phaseolus vulgaris)* in the Congo, Dahomey, Guinea, French Guiana, Sudan, Madagascar, New Caledonia, and Réunion. Lima bean *(Haricot courbé, Phaseolus lunatus)* in French Guiana, the Indies, Madagascar, Réunion. Mung bean *(Haricot mungo, Haricot trilobé, Phaseolus mungo)* in the Indies, Indochina, Madagascar, Réunion.

Soya *(Soja, Dolichos soja)* (p. 204-05): The cultivation of soya dates back to the ancient past in China and Japan. "According to A. Candolle (1885): 'Known facts and historical and philological probabilities tend to show that the species was wild from Cochin-China to the south of Japan and to Java [Indonesia] when the ancient inhabitants of this region began to cultivate it at a very remote period, to use it for food in various ways, and to obtain from it varieties of which the number is remarkable, especially in Japan.' The seeds, which are rich in both nitrogen and oil, enter into culinary preparations which are very popular in these countries. The samples analyzed come from Cambodia, Cochin China, and Tonkin." The protein content of these samples ranges from 34.85% to 38.41%, and the fat content from 12.95% to 14.80%. The mean weight of 100 seeds *(Poids moyen de 100 grains)* varies by country as follows: Cambodia 11.23 gm, Cochin China 9.10 gm, and Tonkin 5.00 gm.

Note: This is the earliest document seen (Jan. 2001) concerning soybeans in Cambodia (renamed Kampuchea in 1979) (one of two documents).

Bambarra groundnuts *(Voandzou, Voandzia [Voandzeia] subterranea)* in Congo and Madagascar. This annual legume comes from sub-tropical Africa, where it is widely cultivated. According to Candolle, it is also called "Mandubi d'Angola." Address: Pharmacien principal de l'armée (Main pharmacist for the French Army).

168. Rodway, Leonard. 1903. The Tasmanian flora. Hobart, Tasmania: John Vail, Government Printer. xix + 320 p. See p. 30-31, 37. Plates. 24 cm.

• ***Summary:*** Under "Order XXV. Leguminosæ" (p. 30-31) it is noted that the genus Glycine has bluish flowers in axillary racemes. Under the genus Glycine (p. 37), the author notes that this is a tropical and sub-tropical genus, differing from neighboring genera in little but habit. The main species listed is *Glycine clandestina* Wendl., "A small twining herb-like undershrub, of few inches to 1½ foot." A brief botanical description is given. It was also known as *Leptocyamus clandestinus*, B. "Common in central and northern grassy bush; also throughout Australia. Flowers in December. Var. *latrobeana*. Flowers rather larger and more crowded. *L. tasmanicus*, H."

Rodway lived 1853-1936. Address: Government Botanist of Tasmania.

169. Moore (H.). 1904. Business notice: English and French goods (Ad). *Mercury (The) (Hobart, Tasmania, Australia)*. Jan. 12. p. 5.

• ***Summary:*** "Just landed from the celebrated Crosse and Blackwell [of England]: Gruyere and Parmasan [Parmesan] Cheese,... Catsup, India Soy, Mushrooms.

Note: This is the most recent of 230 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "India Soy." Address: Grocer, 91 Liverpool-street [Hobart].

170. *Evening Post (Wellington, New Zealand)*. 1904. Seasons in Manchuria: Conditions and food supplies. Interesting particulars. Sept. 21. p. 5.

• ***Summary:*** "A correspondent of the London Times gives the following particulars of the conditions in Manchuria: -

"'It should be well understood that there are two harvest seasons in Manchuria. The first is that of wheat and barley, which in the central and southern provinces ripen at the end of June or early in July, immediately before the usual summer rains, whereas in the northern provinces it follows the rainy season, being cut towards the end of August.

"The second or greater harvest commences, in the extreme south, early in September, and later as one advances northwards, around Kharbin [Harbin], for instance, about the first week in October. The small yellow-grained millet or *ku-tze* is the first, followed quickly by small red millet or *mi-tze*;... Beans, which are the product par excellence of Manchuria, next claim the reaper's attention, and last, but not least, the kao-liang [kaoliang], or tall millet.'"

"'The vast quantities of [soya] bean cake stored in the country from last year's stock, which were not exported as usual to Japan, were enough to support at least 60,000 Russian horses. The [soya] beans and cake were stored in towns within easy access of the Russian centres, and have long since been secured.'"

"'For the cold season the bean curd [tofu] is splendid food for men who have to live in the open air. The supply of this is practically unlimited."

171. Potts, H.W. 1904. Hawkesbury District farm notes. *Agricultural Gazette of New South Wales* 15(12):1232-36. Dec. 2.

• ***Summary:*** The section titled "Soy bean" states (p. 1235): "Soy bean is a leguminous plant grown for both forage and grain, and can be planted under similar conditions in relation to climate, cultivation, and soil as maize. It will produce good returns on light soils, but prefers a soil somewhat heavy and rich in potash, lime, and phosphoric acid. The Early Yellow variety seems the best. The amount of seed required is from ½ to 1 bushel per acre; and constant, shallow cultivation is needed until the plant is fully matured."

172. Moore, George T. 1905. Soil inoculation for legumes: with reports upon the successful use of artificial cultures by practical farmers. *USDA Bureau of Plant Industry, Bulletin* No. 71. 72 p. Jan. 23. See p. 1-46, 67-68, 71-72 + 10 plates. [65 ref]

• ***Summary:*** From the earliest days of agriculture it has been recognized that all plants belonging to the Leguminosae had a decidedly beneficial effect upon the soil. Pliny (A.D. 23-79), the Roman scholar, wrote: "The bean ranks first among the legumes. It fertilizes the ground in which it has been sown as well as any manure" (p. 12). From the early 1800s on there was a great diversity of opinion concerning both the cause and the effect of root nodules of legumes.

Nobbe in Germany isolated a pure culture of nodule forming bacteria from the nodules and grew them in tubes or bottles containing nutrient agar. This culture was given the trade name Nitragin. Seventeen different kinds of Nitragin were prepared from the nodules of as many different plants, and marketed by a well known German firm of manufacturing chemists. Experiments with Nitragin in Germany met with varying degrees of success. In this country the results obtained by Prof. J.F. Duggar using hairy vetch at the Alabama Experiment Station in 1896 and 1897 were very satisfactory, but certain other investigators were not able to secure inoculation.

W.M. Munson at the Maine Agricultural Experiment Station reported in 1897 and 1898 of having fair success in inoculating soybeans with Nitragin, but he failed to get satisfactory results with other legumes. His results did not warrant the recommendation of the use of Nitragin for a leguminous crop. A major problem with Nitragin was that it lost its viability quickly (p. 21). "The percentage of failures in its usage was so great that its manufacture was given up, and it is no longer for sale under that name... For this reason the Laboratory of Plant Physiology of the [U.S.] Department of Agriculture undertook a scientific investigation of the root-nodule organism, and as a result it is believed that a thoroughly practical and satisfactory method of bringing about artificial inoculation has been devised" (p. 22).

Table 1, titled "Number of packages of inoculating material (or inoculated seed) distributed from November, 1902, to November, 1904..." (p. 42-43), lists the following under "Bean, Soy": Alabama 10, Alaska 0, Arizona 0, Arkansas 2, California 3, Colorado 0, Connecticut 4, Delaware 0, District of Columbia 0, Florida 1, Georgia 4, Hawaii 2, Idaho 1, Illinois 36, Indiana 16, Indian Territory 0, Iowa 9, Kansas 10, Kentucky 9, Louisiana 0, Maine 1, Maryland 7, Massachusetts 11, Michigan 10, Minnesota 1, Mississippi 1, Missouri 13, Montana 0, Nebraska 3, Nevada 0, New Hampshire 2, New Jersey 2, New Mexico 0, New York 30, North Carolina 11, North Dakota 0, Ohio 25, Oklahoma 4, Oregon 3, Pennsylvania 17, Philippine Islands 0, Porto Rico 1, Rhode Island 3, South Carolina 1, South Dakota 2, Tennessee 5, Texas 2, Utah 0, Vermont 2, Virginia 48, Washington (state) 3, West Virginia 6, Wisconsin 11, Wyoming 0. Foreign countries: Australia 2, British Guiana 0, Canada 1, Costa Rica 1, Cuba 2,... South Africa 2. Total: 391.

The next section, titled "Reports" (p. 44), begins: "While it has been impossible to receive reports from all experimenters, the percentage of replies has been unusually large and is quite sufficient to enable the formation of a fair opinion as to the value of the cultures distributed. Table II, "Reports of experiments with principal crops" (p. 45), shows the following for soy bean: Total reports: 129. Inoculation resulting in definite increase of crop: 54. Failures definitely ascribed to bad season, poor seed, weed growth, etc.: 22. No increase in crop; organisms already present in the soil: 11. No evident advantage from inoculation; nodules not formed: 42. Percentage of failure: 43%.

After discussing the nature of the organism, the author lists farmers in the following areas who have used the "artificial culture" successfully to inoculate soybeans: Rash, Alabama; Gainesville, Georgia; Napoopoo, Hawaii (Gordon Glore–Inoculation successful. Increased growth of plant and abundance of root nodules); Winchester, Kentucky; Bynum, Maryland; Marionville, Missouri; Dome, North Carolina; Guys Mills, Pennsylvania; Spring City, Tennessee; and seven towns in Virginia (p. 67).

The author states that alkaline nitrates in the proportion of 1 to 10,000 are sufficient to prevent the formation of nodules. Photos show: (I) Package of inoculating material for sufficient for four acres of alfalfa, with a letter titled "Directions for using inoculating material," from the U.S. Department of Agriculture, Bureau of Plant Industry. (II) Effect of rich nitrogenous soil upon formation of nodules of soy beans; few nodules. Same culture and seed used as in Plates III and IV. (III) Effect of poor sandy soil upon formation of nodules of soy beans; more nodules. (IV) Effect of poor clay soil upon formation of nodules of soy beans; many nodules. Conclusion: Soybeans grown in a poor sandy soil or in a poor clay soil have a greater number of nodules than plants grown in a rich nitrogenous soil. He states also that fully as striking differences might be shown in a soil in which the moisture or the acidity or the air supply varies, and that the application of calcium or magnesium will act differently on nodule production depending on whether the plant grows under acid or alkaline conditions.

Note 1. This is the earliest document seen (June 2007) that clearly refers to the cultivation of soybeans in Hawaii. They may have been grown there in 1900, at which time one variety was introduced to the USA from Hawaii.

Note: 2. This is the earliest document seen (June 2007) concerning soybeans in connection with West Virginia. Since 6 packages of soybean inoculating material (or inoculated seed) were sent to West Virginia from November, 1902, to November, 1904, its seems likely that soybeans were in West Virginia and being cultivated there by 1905–but we cannot be sure.

Note: 3. This is the earliest document seen (June 2007) concerning soybeans in connection with Oregon. Since 3 packages of soybean inoculating material (or inoculated seed) were sent to Oregon from November, 1902, to November, 1904, its seems likely that soybeans were in Oregon and being cultivated there by 1905–but we cannot be sure.

Note: 4. This is the earliest document seen (Dec. 2008) concerning soybeans in connection with Cuba. Since 2 packages of soybean inoculating material (or inoculated seed) were sent to Cuba from November, 1902, to November, 1904, its seems likely that soybeans were in Cuba and being cultivated there by 1905–but we cannot be sure.

Note: 5. This is the earliest document seen (Feb. 2009) concerning soybeans in connection with Costa Rica, or with Central America. Since 1 package of soybean inoculating material (or inoculated seed) was sent to Costa Rica from November, 1902, to November, 1904, its seems likely that soybeans were in Costa Rica and being cultivated there by 1905–but we cannot be sure. Address: Physiologist in Charge of Lab. of Plant Physiology.

173. *Star (Canterbury, New Zealand).* 1905. Fish as war food: The fish eater versus the beef eater. Tabloids of brain and nerve food furnished as emergency rations. Feb. 25. p. 2.

• ***Summary:*** "(By Frank G. Carpenter, in the New Orleans 'Times-Democrat'). Washington, December 29, 1904. I saw this morning a specimen of the emergency rations furnished the Japanese Army. It [katsuobushi] looked like a petrified banana of the largest size,...

There follows a conversation with Dr. Hugh M. Smith about fish in Japan.

"Raw fish. 'How about eating fish raw, doctor, I understand that is common in Japan?'

"'It is, and I assure you that raw fish are not so bad when properly served. Take a fresh tai [sea bream] and slice it thin. Bring it cold to the table and eat it with chop-sticks, dipping each bite in soy or bean sauce, and you will find it delicious. The Japanese, however, usually eat their fish cooked.'"

174. Potts, H.W. 1905. Farm Notes: Hawkesbury District–November. *Agricultural Gazette of New South Wales* 16(11):1146-49. Nov. 2.

• ***Summary:*** The section titled "Cowpeas and soy beans" (p. 1149) is mostly about cowpeas. The last sentence states: "Soy beans provide a useful cleansing crop."

175. Duthie, John Firminger. 1905. Flora of the upper Gangetic plain and of the adjacent Siwalik and sub-Himalayan tracts. Vol. 1. Ranunculaceae to Campanulacae. Dehra Dun, India: M/s. Bishen Singh Mahendra Pal Singh; Delhi, India: M/s. Periodical Experts. 500 p. + v. See p. 231-32. [6 ref]

• ***Summary:*** In the section on "Leguminosæ" we read (p. 230-31): "20. Glycine, Linn.; Fl. Brit. Ind. ii, 183 [Hooker, Joseph D. 1879. *The Flora of British India.* Vol. 2, p. 183].

"Twining or suberect herbs... Species about 15, spread through the tropics of the old world, also in Australia.

"*G. Soja,* Benth, in *Journ. Linn. Soc.* viii, 266: F.B.I. ii, 184 (not of Sieb. & Zucc.) G. hispida, Maxim.; Watt E.D.; *Field & Gard. Crops* iii, 3, t. 85; Prain in *Journ. As. Soc. Beng.* LXVI (1897), 403. Soja hispida, Moench.; W.&A. *Prod* 247. Dolichos Soja, Linn.; *Roxb. Fl. Ind.* [Roxburgh's Flora Indica] iii, 314; DC. *L'Orig. Pl. Cult* 264. Vern. [Vernacuar] *Bhat.* (Soy bean, Japan pea).

"An annual, with stout suberect or climbing stems, densely clothed with fine rusty-coloured hairs. *Leaves* 3-foliolate, long-petioled; *leaflets* 2-4 in. long, ovate, usually acute. *Racemes* sessile, few-flowered. *Calyx* ¼ in., densely hairy; teeth long, setaceous. *Corolla* reddish-purple, not much exserted [sic]. *Pods* 2-3 in the axils of the leaves, 1½-2 in. long, linear-oblong, recurved, densely pubescent, subtorulose, 3-4 seeded.

"Sparingly cultivated within the area, and confined to a few of the Sub-Himalayan districts. It is grown more extensively on the lower slopes of the Himalaya up to 6,000 feet, from the Punjab eastwards; also in Bengal, on the Khasia, Manipur and Naga Hills, and in Burma, but nowhere in India has it been found truly wild. De Candolle considered the plant to be a native of Cochin China, Japan and Java at the time when the ancient inhabitants of that region began to cultivate it, and to use it as food. As grown within the area of this flora, and in other parts of India, it represents a very inferior form of soy bean. It is a rainy-season crop, and is usually sown in very poor land. Under proper cultivation the chemical composition of the bean shows it to be the richest of all the pulses in albuminoids and oil. In China and Japan various preparations are made from it, including soy-sauce, which is largely exported from those countries. The plant affords very excellent fodder for all kinds of stock, if harvested before it is fully matured." Address: B.A., F.L.S., Formerly Director of the Botanical Dep. of Northern India.

176. *Otago Witness (New Zealand).* 1906. A Japanese edible plant–Udo. April 11. p. 8.
• ***Summary:*** "Washington [DC], January 9.–'Udo' is the name of a Japanese plant the Department of Agriculture is trying to introduce into the United States to compete with lettuce as a winter salad... It is tabled in all the tea houses in Japan, its crisp, blanched stems being served with salt or boiled with a soy sauce."

177. Mann & Co. 1906. Now landing: Ex S.S. Tokomaru, from London (Ad). *Bay of Plenty Times (New Zealand).* April 23. p. 3, col. 5.
• ***Summary:*** "Crosse & Blackwell's Fine sheet gelatine, Walnut catsup, Essence anchovies, China soy [sauce] and Fine Lucca salad oil..." Address: Auckland.

178. *Hawera & Normanby Star (Taranaki, New Zealand).* 1906. Strange stories from American papers. April 27. p. 2.
• ***Summary:*** The section titled "Seven to die for horrible crime" begins: "A telegram from Hile [sic, Hilo], on the Island of Hawaii, says that seven Coreans [Koreans] were recently convicted of murder in the first degree in the Supreme Court." "One Corean was suspected of having stolen £10 from another, and, instead of reporting the theft to the police, the friends of the man who lost the money adopted Corean methods. The suspected Corean was chased through the cane-fields, and when captured was beaten with sticks and stones until he was exhausted. As he still refused to confess, they rubbed salt in his wounds... When this torture failed to force a confession, they rubbed Japanese soy into the wounds, causing excruciating pain..."

179. *Queensland Agricultural Journal.* 1906. The soya, or soy bean (Abstract). 16(9):546-47. June.
• ***Summary:*** A long English-language summary of the following English-language article: Macmillan, H.F. 1905. "The 'Soya (or Soy) Bean.' (Glycine hispida). A new vegetable, fodder, and green-manure product for Ceylon." *Tropical Agriculturist* (Ceylon) 25(5):682-83. Nov. 15.

180. *Otago Witness (New Zealand).* 1907. Notes and queries. Feb. 20. p. 47.
• ***Summary:*** "Inquirer.–To make Worcestershire sauce mix together 1½ gallons white wine vinegar, 1 gallon walnut catsup, 1 gallon mushroom catsup, ½ gallon Maderia [Madeira] wine, ½ gallon Canton soy, 2½ pounds moist sugar, 19 ounces salt, 3 ounces powdered capsicum, 1½ ounces each of pimento and coriander, 1½ ounces chutney, 3/4 ounce each of cloves mace and cinnamon, and 6½ drams of assafoetida [asafoetida] dissolved in 1 pint brandy 20 above proof. Boil 2 pounds hog's liver for 12 hours in 1 gallon of water, adding water as required to keep the quantity; then mix the boiled liver thoroughly with the water; strain it through a coarse sieve. Add this to the sauce."

Note: This recipe for Worcestershire sauce contains soy sauce (Canton soy) as an ingredient.

181. *Poverty Bay Herald (Gisborne, New Zealand).* 1907. Our mail bag: Japanese vegetable milk. March 16. p. 7.
• ***Summary:*** A condensed vegetable milk has been prepared by Professor Katayama of the Imperial Agricultural College, Tokio, but it is not yet a commercial article.

"It is prepared from soy beans, and the liquid is said to be very similar in appearance to cows milk, having a yellowish color and an agreeable taste which would be quite like the product but for a slight odor of beans."

182. *Sydney Mail (Australia).* 1907. Interesting experiments. May 22. p. 1298, col. 2.
• ***Summary:*** Describes experiments at the West Virginia experiment station in the United States to see if the flavour of eggs could be improved by changing the feed. "... cow peas, soy beans, peanuts, and sunflower seed" were among the grains fed.

183. Government Statistician (NSW). 1907. Diagram map of New South Wales: Showing how the state is subdivided for statistical and rainfall purposes. *Agricultural Gazette of New South Wales* 18(8):Insert after p. 714. Aug. 2.
• ***Summary:*** An excellent color map. New South Wales, whose main city at this time is Sydney, lies on the west coast of Australia, bounded on the north by Queensland (capital: Brisbane), on the south by Victoria (capital: Melbourne), and on the east by South Australia (capital: Adelaide). A legend shows that the state is divided into 12 large regions, each numbered and explained. Each of the divisions is shown.

184. *Sydney Mail (Australia).* 1907. Answers to correspondents. Oct. 16. p. 23.
• ***Summary:*** Gwen.–1... A recipe for homemade Worcestershire includes "a gill of Indian soy [sauce]."

185. *Otago Witness (New Zealand).* 1908. Science notes. Jan. 22. p. 84.
• ***Summary:*** In a recent number of a Japanese journal, a Mr. T. Katajama [Katayama] described a process for the manufacture of a vegetable milk, the properties of which would render it highly suitable for use in tropical countries. The, preparation is obtained from a well-known member of the leguminous family of plants–namely, the Soja bean–which is a very popular article of food among the Chinese. The beans are, first of all, softened by soaking, and are then pressed and boiled in water. The resultant liquid is exactly similar to cows' milk in appearance, but it is entirely different in its composition.

"This Soja bean-milk contains 92.5 per cent. water, 3.02 per cent. proteine, 2.13 per cent. fat, 0.03 per cent. fibre, 1.88 per cent. non-nitrogenous substances, and 0.41 per cent. ash. Katajama added some sugar and a little phosphate of potassium (in order to prevent the elimination of the albumen), and then boiled the mixture down till a substance like condensed milk as obtained; this 'condensed vegetable milk' is of a yellowish colour, and has a very pleasant taste, hardly to be distinguished from that of real cows' milk. However it still retains the aroma of the Soja bean. It is recommended as a cheap and good substitute for condensed cows' milk."

Note: Summaries of this article appeared several times in New Zealand newspaper articles until 1914.

186. *Otago Witness (New Zealand).* 1908. Inoculation of plants. Feb. 19. p. 9.
• ***Summary:*** From Mark Lane Express: "According to a bulletin issued by the United States Department of Agriculture, nearly every legume has its own particular strain of nodule bacteria. For example, that of the clover is different from that of lucerne, and that of the cow pea from that of the soy bean."

"Artificial inoculation is usually accomplished with ease as regards cow peas, red clover, vetches, field peas, and most other legumes. Soy beans, however, frequently give negative results."

187. *Advertiser (The) (Adelaide, South Australia).* 1908. Correspondence: A curious milk used in Japan is described in a Japanese periodical. June 9. p. 11.
• ***Summary:*** "It is made from the Soja bean. The liquid is exactly like cow's milk in appearance, and in taste can hardly be distinguished from it. To make it the beans are first soaked and then boiled in water. Some sugar and phosphate of potassium are added, and it is boiled down till it has the consistency of condensed milk."

188. Griffiths, E.A. 1908. Japan: Report for the year 1907 on the trade of the consular district of Shimonoseki. *Diplomatic and Consular Reports, Annual Series (Foreign Office, Great Britain).* No. 4106. 15 p. Aug.
• ***Summary:*** A map shows the Consular District of Shimonoseki, comprising the prefectures of Yamaguchi, Hiroshima, Fukuoka, and Oita. Shimonoseki is a seaport city located just north of Kyushu, on the Shimonoseki Strait, in Yamaguchi prefecture at the southwest extremity of Honshu. Opposite Shimonoseki, on the northern tip of Kyushu, is the city of Moji.

In the section titled "Imports" under "Manure" (p. 6) we read that there has been a very large increase in the import of [soybean] "oil cake," amounting to 20,732 tons in quantity and 146,052*l* (British pounds sterling) in value over the figures for 1906. Other fertilizer imports were fish manure from Corea [Korea] and phosphate rock (phosphorite) from Christmas Island. The latter was used (at Hikoshima, an island at the western entrance to the Straits of Shimonoseki) to make superphosphates for fertilizers, which were exported. Address: British Consul for Shimonoseki, Japan.

189. *Otago Witness (New Zealand).* 1908. The journey to Kagoshima. Sept. 9. p. 15.
• ***Summary:*** "There was also a great variety of beans, besides the ever-present soya [bean], from which Japan's national soy sauce is made."

Note: Kagoshima is a city at the southwestern tip of Kyushu, Japan's southernmost large island.

190. *Agricultural Gazette of New South Wales.* 1908. Soy or soja bean. 19(10):811. Oct. 2.
• ***Summary:*** The Soy or soja bean "comes from Japan, and of late years has attracted attention as an annual leguminous plant which produces the richest of all beans in protein and fat. It closely resembles the cowpea... They give a greater yield of beans than cowpeas. They are not trailing in habit, hence are more easily harvested."

"As a food for pigs, either as beans, green forage, or hay, it has a high reputation. The animals fatten quickly, are always thrifty, with strong appetites; the hair and skin acquire a glossy look, and the skin feels as if they were fed on oil meals."

Yields as high as 10 bushels/acre were obtained. Address: Australia.

191. Potts, H.W. 1908. Hawkesbury Agricultural College and Experimental Farm: Feeding of pigs. *Agricultural Gazette of New South Wales* 19(10):808-12. Oct.
• ***Summary:*** Continued from p. 642. X. Cowpeas. Soy beans. Velvet beans. The section titled "Soy or soja bean" (p. 811) states: "They give a greater yield of beans than cowpeas. They are not trailing in habit, hence are more easily harvested."

"As a food for pigs, either as beans, green forage, or hay, it has a high reputation. The animals fatten quickly,... with strong appetites; the hair and skin acquire a glossy look, and the skin feels as if they were fed on oil meals."

192. William Morse's work with soybeans for the USDA (Photographs). 1908-1949.
• ***Summary:*** These photographs, taken from 1908 to 1949, were sent to Soyfoods Center in 2004 by Joyce Garrison of Hartford, Connecticut. They are arranged below in the order in which they appear in William Morse's personal scrapbook (p. 73-91).

(1) 1920–Division of Forage Crops. Shown left to right are F. McDonald, C.W. Reed, Arthur Jones, A. Lydenberg, P.L. Ricker, Carvier Lyman, A. Hansen, and H. L. Westover.

A note by Morse next to the photo reads, "Harvey L. Westover: A very good friend of my parents. I called him Uncle "H." He roomed and boarded at my father's parents' house." (2) 1920–Division of Forage Crops. Shown left to right are L.W. Kephart, B.C. Connor, W.J. Morse, C.V. Piper (Chief of the Division), A.J. Pieters, R.A. Oakley, Roland McKee, and H.N. Vinall.

(3) 1908–W.J. Morse in a field of Piper's African Annual Sudan grass at Arlington Experimental Farm in Virginia. (4) 1908–W.J. Morse with Virginia soybeans and corn for silage at Arlington Experimental Farm. (5) 1933 Aug.–W.J. Morse on a soybean breeding plot at the Louisiana Experimental Station in Baton Rouge. (6) W.J. Morse (left, in a striped hat) and C.K. McClelland (right) in Arkansas, perhaps at the 1934 meeting of the American Soybean Association.

(7) 1948 Aug.–Dr. Lew Allison (left, in a white shirt and necktie) and W.J. Morse (right, in a coat) at the Soybean Experimental Plots in Beltsville, Maryland. (8) 1948 Aug.–Dr. Lew Allison (left), William Stuart (center) and W.J. Morse (right, in a hat) in Beltsville. (9) 1948 Aug.–W.J. Morse (in a hat and smoking a cigarette) in Beltsville. (10) 1923 Sept.–W.J. Morse talking to farmers on Soybean Field Day in Effingham, Illinois. (11) 1928–Morse with others at the American Soybean Association meeting in Lafayette, Indiana. (12) 1928–W.J. Morse with Glenn McElroy of Ohio at the American Soybean Association meeting in Lafayette.

(13) 1930–W.J. Morse and P.H. Dorsett. (14) 1930–W.J. Morse with Japanese scientific (?) men at the Kung Chuling Experimental Station in Manchuria. Note: Kungchuling, Chilin -> Gongzhuling, Jilin. (15) 1930 Oct.–Morse in Seoul (Keijo) Korea. (16) 1930–Aug. 27–W.J. Morse in a field of soybeans near Pyong Yang, Korea. Note: P'yongyang (Japanese *Heijo)* is the present (2004) capital of North Korea. (17) 1912 (or 1908)–"First planting of annual Sudan grass obtained by Dr. C.V. Piper from Sudan, Africa." (18) 1944 (or 1948)–Dr. Lew Allison (left), William Stuart (center) and W.J. Morse (right) on the site of soybean breeding experiments in Beltsville, Maryland. (19) 1944 (or 1948)–Dr. Lew Allison and W.J. Morse in Beltsville, Maryland.

(20) 1944 (or 1948)–W.J. Morse in a hat, coat and tie in Beltsville. (21) 1944 (or 1948)–W.J. Morse touching soybean plants in Beltsville. (22) 1944 (or 1948)–W.J. Morse in soybean rows in Beltsville. (23) 1944–Division of Forage Crops and Diseases, including Dr. O.S. Aamodt, Chief, seated on a set of front porch stairs in Beltsville, Maryland. (24) 1944–Divisions of Cereal Crops and Forage Crops and Diseases, including Dr. O.S. Aamodt, Chief of Forage Crops, and Dr. M.A. McCall, Chief of Cereal Crops, standing on front porch stairs in Beltsville, Maryland.

(25) 1933 Aug.–W.J. Morse and Dr. John Gray, agronomist from the Louisiana Experimental Station in Baton Rouge. (26) 1933 Aug.–Thomas Gilmore and John Gilmore, soybean growers of Sandersville, Georgia. (27) 1944 Sept.–American Soybean Association Silver Jubilee meeting, held in Urbana Illinois on September 12-13. Shown left to right are: Back row: C.K. McLelland from Arkansas, Jacob Hartz from Arkansas, R.G. Wiggans from Cornell University [Ithaca, New York], K.E. Beeson from Indiana, David Wing from Ohio, W. E. Reigel from Illinois. Front row: J.B. Edmondston from Indiana, John T. Smith from Illinois, Taylor Fouts from Indiana, W.J. Morse from Washington DC, George Briggs from Wisconsin, J.C. Hackleman from Illinois. Full page.

(28) 1936–American Soybean Association annual meeting, Ames, Iowa. President: W.J. Morse, USDA. Vice-President: F.S. Wilkins, Iowa Experimental Station and College. "At this meeting Henry A. Wallace (afterwards Secretary of Agriculture and Vice President of the United States) was a reporter for 'Wallace's Farmer.' Full page. (29) 1946–E.F. "Soybean" Johnson, W.J. Morse, and W.L. Burlison at the annual meeting of the American Soybean Association in St. Louis, Missouri. (30) Conference of Collaborators at the Soybean Regional Laboratory in Urbana, Illinois. Perhaps 1948. Full page.

(31) W.J. Morse with Australian agriculture officials who came to study soybeans in the U.S. Full page. (32) 1949 Nov. 22–Retirement party for W.J. Morse. Morse stands center among co-workers on stairs in Beltsville, Maryland. (33) 1946 Oct.–Roland McKee, P.L. Ricker and W.J. Morse, seated and looking over documents. (34) J.K. Cartter and W.J. Morse at the Regional Soybean Laboratory in Urbana, Illinois. (35) 1947–J.L. Cartter and W.J. Morse at the Soybean Industrial Conference in Peoria, Illinois. (36) 1936–W.J. Morse at the American Soybean Association's annual meeting at the soybean breeding plots in Ames, Iowa.

(37) 1939–U.S. Senator Bankhead painting Frank Tenton's boat with soybean oil varnish in the Potomac River Basin in Washington DC. Shown left to right are W. Donovan, H.T. Herrick, Senator Bankhead, W.J. Morse. (38) W.J. Morse. Perhaps 1940s.

193. Brown, J. Macmillan. 1909. Pacific problems: Chinese and Japanese in Manchuria. XII–The moulding of the Chinese race. *Evening Post (Wellington, New Zealand).* Jan. 4. p. 3.

• ***Summary:*** "(Specially written for The Post)." This long, scholarly article includes a description of the people, land, and agriculture of Manchuria. "The farmhouses are few and far between, though the millet fields are continuous from mountain-top to plain. In other words, the farms are large; there is none of the small intensive culture of China and Japan. A single patch of millet or maize or soybean covers many acres." Address: Prof.

194. *Poverty Bay Herald (Gisborne, New Zealand).*1909. New food from China. March 13. p. 2.
• ***Summary:*** "London, Jan. 16–A new food is coming to town–new, that is, in the sense that comparatively few people in the country have partaken of it.

"The soja or soya bean is a product of Manchuria. In appearance it somewhat resembles the ordinary lentil, while in taste (uncooked [sic]) it approaches very nearly to the taste of the common 'split' pea.

"It has only heretofore been brought to this country in very small quantities, and, in spite of the fact that it constitutes almost the staple food [sic] of the Chinese laborer, it has never been seriously considered by Western civilisation as a bean with food properties.

"Travellers who have journeyed through the interior of Manchuria tell marvelous stories of Chinese carriers who will cover thirty miles a day regularly with a load of 120 1b or 130 lb upon their backs, and these laborers keep up their strength for this work by eating the soja bean.

"Some British physicians have recognised its value as a food for diabetes, and it is also prescribed at certain large German hospitals for the same' complaint. The Japanese have for many years past laid it under contribution as the basis of their well-known piquant sauce, and it is from one of the Japanese firms that Europe will shortly receive a consignment of, it is anticipated, well over 100,000 tons.

"As a food the bean is prepared in very similar fashion to the method employed in cooking ground rice" [sic].

195. *Mercury (The) (Hobart, Tasmania, Australia).*1909. Trade and finance. July 19. p. 3.
• ***Summary:*** "For some time past the oil crushers of the United Kingdom have been giving considerable attention to the soya bean. One large firm now sends samples of soya oil in both a crude and refined state, and at the same time writes concerning this product in the following terms:- 'Soya oil is now finding a very large outlet in this country for soapmaking purposes. Most of the soapmakers are taking refined oil, but some use crude; but in the latter case we think they do the refining themselves. The oil has rather a lower fatty acid melting point than cotton oil; consequently when used alone it would not make a hard soap, and most of the soapmakers here have found it necessary on that account when using soya oil to increase the quantity of other hard fats, such as tallow, cocoanut oil, palm-nut oil, etc.; and we believe some of them have met with considerable success by using Chinese vegetable tallow along with soya oil. The yield of glycerine is quite as good as that from cotton oil, and we believe it has proved an excellent fat for softsoap. The refined oil is also finding a very largo market for edible purposes, and is being taken up by the fatmakers, fish-fryers, etc."

196. Guthrie, F.B. 1909. Pea-nut and bean cakes. *Agricultural Gazette of New South Wales* 20(8):670-72. Aug. 2.
• ***Summary:*** After discussing and analyzing the composition of pea-nut cake, the article continues: "A similar product [soybean cake] from China has come under our notice. It is obtained from a small green bean grown in North China and Manchuria. These beans are rich in oil, and the oil is expressed in stone-mills and presses and used as a lubricant and, in China, for cooking. The cake left after expressing the oil is pressed into large discs about 2 feet diameter and 6 inches thick and weighing about 42 to 48 lb.

"It is ground up and used in the East as a manure. It is also used, but less extensively, as a fodder. An analysis of a portion of one of these cakes shows it to be a highly nitrogenous food very similar in composition to the pea-nut cake."

A table shows the analysis of [soy] bean cake: Moisture 14.52%, ash 5.16%, fibre 4.03%, albuminoids 42.31%, carbohydrates 25.25%, ether extract (fat and oil) 8.73%. Nutritive value 87.3. Albuminoid ratio 1 to 1.06.

Note: The "small green bean" must be the soy bean, because the mung bean contains very little oil. Address: Australia.

197. *Otago Witness (New Zealand).*1909. New Zealand products: Markets in the East. Oct. 6. p. 21.
• ***Summary:*** "(From our own correspondent). London, Aug. 20. Another hint has been received this week of the genesis of a large market for New Zealand products in the East"– where 400 million people are gradually beginning to adopt European practices.

"The head of the cattle-breeding department of the Japanese Government (Mr. Hashimoto) is at present visiting this country [Great Britain] to make purchases of stock.

"'Meat-eating,' said Mr. Hashimoto, is on the increase in Japan. Its popularity is increased by the recently advanced theory that an over-consumption of rice is a source of beri-beri. The Japanese peasant does not eat much rice; it is too dear. Barley, vegetables, and fish are his staple foods. The upper and middle classes, however, who have hitherto eaten large quantities of rice, are now slowly beginning to add meat to their dietary. Beef is the favourite dish. It is cut up small, boiled with a native bean sauce [soy sauce] and vegetables, and eaten with the hashi or chopsticks."

About 10-12 years ago Japan began to import European cattle into Japan to improve their native breeds. "'For ploughing purposes, Japanese farmers invariably use cattle. For this purpose the native breeds are good, but for milk and beef they are poor.'"

198. *Colonist (Nelson, New Zealand).*1909. News of the day. Nov. 13. p. 2.

• ***Summary:*** "The Japanese have discovered a cheap and good substitute for the milch cow in the form of a tiny bean. The juice, which is extracted by a special process from the bean, is said to be an excellent vegetable milk, the properties of which render it highly suitable for use in tropical countries. The preparation, according to the "Java Times," is obtained from the soya bean, a member of the leguminous family of plants, and a very popular article of food among the poorer classes [sic] of Chinese and Japanese."

199. *Star (Canterbury, New Zealand).* 1909. Brief mention. Nov. 20. p. 4.

• ***Summary:*** "A new industry [sic] has sprung up in Japan in the cultivation of a plant known as the Soja bean, which is indigenous to Central Japan [sic] and Lower Manchuria. About three years ago a trial shipment of this bean was made to England, amounting in all to about 200 tons. Last year the export totalled 80,000 tons, and this year it is expected, 250,000 tons will be shipped.

"The value of this bean lies not only in the quantity of oil of high grade for lighting and lubricating purposes contained, but in the residue after the oil is expressed. This is of a highly nutritious nature, possessing a big percentage of nitrogen, and it is employed in the manufacture of biscuits, 1 as well as having great value as a fodder for stock."

Note: This article is filled with errors. For example: (1) The soja bean has been cultivated in Japan for at least 1,000 years. (2) It is native to northeastern China, not to Japan. (3) The nitrogen-rich portion is used almost entirely for livestock feed, and only in tiny amounts for making biscuits.

200. *Advertiser (The) (Adelaide, South Australia).* 1909. The producer: Dec. 24. p. 10.

• ***Summary:*** The Madras "Times" of December 1 writes:- "The market demand for that comparatively new product the Soya bean of Manchuria has recently been showing signs of expansion. Europe and America are large buyers. These beans, it is said, are nearly three times as rich in albuminoids as oats or wheat. In Germany and America the bean is being ground to form an ingredient of bread, and Soya flour and meal may be used for biscuit-making and confectionery. In Switzerland the legume is cooked as a vegetable, and the dried bean when roasted is used as a substitute for coffee. The oil is used in the manufacture of margarine as well as soap and paint, while the Chinese turn it into condiments and burn it in lamps. It is obvious that the Soya is a most useful plant, serving as many economic purposes as the cocoanut, and large quantities are being absorbed in the markets of Europe, America, and of the Far East. Russia, for instance, is a large buyer. The price has naturally risen with this increase of demand, and Soya oil has risen £3 a ton, the London price when the last mail left being about £25 5*s.*"

201. *Advertiser (The) (Adelaide, South Australia).* 1909. The soya bean. Dec. 31. p. 11.

• ***Summary:*** "The sudden appearance of the Soya bean in the news columns of the agricultural press of the States and of the old country [Great Britain] must be accepted as evidence of the sound value of the plant, of whose possibilities there appears to be no end. Mixed with flour and meal, the Soya, after grinding, makes up into marketable confectionery and biscuits. In Switzerland it is cooked as a vegetable, and, dried and roasted, is made to do duty as coffee. Also, it is largely employed in the making of margarine, and the Chinese use the oil for burning in lamps. It is used as cattle fodder and authorities have pronounced favorably on its value when mixed, two parts of Soya to one part of cheap undecorticated cotton cake; and, after its 17 per cent. of oil is taken, the last use of the bean is as a fertiliser, and in this capacity it is highly written of.

"It is not often a novelty of this kind catches on with the English farmer, who is ultra-conservative, but soya had so much that was worthy in it that it was taken up on its introduction to England, a little over a year ago, when botanists were the only people who knew anything at all about it, and now it is used in one way or another on hundreds of farms in the British Isles. At present the bean is being imported in quantities from China and Japan, where for centuries it has been cultivated for fodder, for human consumption, for its oil, and for its manurial usefulness, and it is anticipated that the imports to England for the coming year will be in the neighborhood of 600,000 tons."

202. Jones, W.J. 1910. Manchurian development: The railways and the beans. *Grey River Argus (West Coast, New Zealand).* Jan. 3. p. 4.

• ***Summary:*** Contents: Introduction. A progressive company. The possibilities of the line. Refreshing solicitude. The ubiquitous [soja] bean. The processes of distribution. What the bean produces. The future of the beans.

Introduction: "Were any justification required for Dairen's existence as a city of importance it would be found in the fact that the splendid town which Russia established and Japan has improved is the headquarters of the South Manchurian Railway and the outlet for practically all the beans exported from the districts south of the Sungari river. The railway carries the beans, and the beans in return provide the Company with a material portion of its revenue. It is a fair exchange and as a result of the processes Dairen benefits. The South Manchurian Railway Company has been in existence for three years, being organised in 1906, with an authorised capital of £20,000,000 to operate the railway between Dairen and Kwancheng-tzu [Kuancheng district in the city of Changchun in Jilin Province;

Kuanchengtze or Kuancheng-tze] transferred from Russia to Japan under the Treaty of Portsmouth. The enterprise was not thrust into the world fully matured; it passed through all the infantile ailments.

"During the progress of the war the gauge of the railway had been altered from 5 ft to 3 ft 6 inches that it might be adapted to the rolling stock bought from Japan to carry troops and supplies. For considerably over a year only a small number of second and third class cars were available and the complaints of the traveller–some reasonable, others gratuitous–were loud and frequent. With the conversion of the line to its present gauge of 4 ft 8½ inches and the arrival of the new equipment of engines and carriages from America the enterprise began to rise superior to serious criticism. Figuratively speaking, it took wings and began to soar out of the labyrinth of difficulties which beset it in its initial stage:..."

"A progressive company: There are indeed few more enterprising concerns than the South Manchurian Railway Company, and it is obvious that they have at heart the development of a country which has hitherto persistently ignored its natural resources." The main line runs from Dairen to Kwancheng-tzu, a distance of 483 miles, at 27½ miles per hour. The attention paid to the needs and comfort of the traveler is "unremitting almost to the point of embarrassment." The dining cars and sleeping cars are commodious and excellent. "When the farmers have been convinced that they are at present merely tinkering with the soil, and direct their attention to serious husbandry, the South Manchurian Railway Company must be one of the most important carrying agents in any part of the globe. Up till now perhaps even the name is unknown in Europe outside Hazell's or Whittaker's."

"The possibilities of the line: The railway is the prime factor in the development of trade in South and Central Manchuria. Its ramifications afford the farmer who has hitherto been merely a local producer an opportunity of coming into the market and securing the best ruling prices. The advantages are mutual... Tourists can now travel from London to Dairen by train in 14 days. From "June to December it is necessary to book weeks ahead to ensure a passage. Tsuruga to Vladivostock is still the route for the bulk of the tourists, but this is due to the almost incomprehensible lack of knowledge possessed by the travelling public, not to any superior advantages offered by the Russian port. The day of Dairen and Antung [as a route for tourists] is coming, and is within the sphere of next year's possibilities.

"Refreshing solicitude: The enthusiasm evinced by the public in the Company's operations augurs well for future success." "One cannot help being impressed with the pride of possession evinced, and the train boy who chases the flies off the windows is as important and as proud of the railway as the entire Board of Directors... Every manifestation of progress in South Manchuria contributes towards the success of the line, and manifestations of progress are so consistent and so numerous as to carry conviction to the heart of the most hopeless pessimist.

"The ubiquitous bean: The interests of the railway and the bean trade are inseparable. They are the blood and bone of Manchuria and provide occupation for practically all the merchants at present doing business in the country and at least three parts of the entire population. The bean industry is not a new one, but until recently the volume of business was reckoned by the peck; now it fills the bushel measure. Twenty years ago crops were grown, small areas being laid down calmly and deliberately in monotonous routine. The increase up till 1906 was almost imperceptible, cultivation of beans being confined almost entirely to the Liaoyang districts, while the markets were Japan, and in less degree Shanghai, Swatow, Amoy, and Chefoo. The approach of harvest brought with it no feverish expectancy either on the part of the farmers or merchants. The output never exceeded 200,000 tons, and in most instances it was a great deal less than this. The Chinaman seemed incapable of realising the great possibilities of the industry and was content to adjust his supply to the restricted demand. But in 1906 the 'awakening' came and since that time the bean has been almost an obsession throughout the country. It was an epoch-making discovery, and everything now dates from the beginning of the bean era. Crops are grown everywhere, supplies are stored everywhere, and nothing else is talked about anywhere. Dairen wharf during the season is a (?) of indescribable activity. Changchun becomes the focus for converging strings of Chinese carts, and the railway has to work day and night to keep pace with the requirements of shippers. The bean trade has become a real industry and for the stimulus given to it the Shanghai merchants are to thank, as they resolutely laid siege to a somewhat unwilling Government until the latter agreed to open up the country for more extensive cultivation. As a result the crop for 1906 had increased to 400,000 tons, double the best previous yield [crop]. Since then a gradual development has taken place and the returns for 1908 show 1,200,000 tons, or an increase of 70 per cent on the yield for the year previous. It is estimated that the crop now coming to maturity will amount to 1,500,000 or 1,600,000 tons, an increase of 30 per cent on that for 1908. The markets have already extended to London and several places on the Continent, small trial shipments being sent a year ago, with such satisfactory results that up till the end of June 160,000 tons of last year's crop have been shipped to Europe from Dairen and 180,000 tons from Vladivostock. In England the bean cake is largely use as a fodder for cattle, and according to reliable reports it has proved a splendid fattening and milk-producing agent." Continued.

203. Jones, W.J. 1910. Manchurian development: The railways and the beans (Continued–Document part II). *Grey River Argus (West Coast, New Zealand).* Jan. 3. p. 4.
• ***Summary:*** Continued: "The process of distribution. The bean, which is commonly known as the Sakura oil bean in South Manchuria, and the Soja bean in Vladivostock, has the appearance of the wild pea. It is now principally grown in the districts from Ta-shih-chao to the immediate south of Harbin for practically the whole breadth of the country, along the Antung route, and in many parts of Korea. The Kwancheng-tzu district has the distinction of being the greatest bean-producing centre and Chang-chun exists entirely for and upon beans. The processes through which the crop goes after leaving the hands of the producer are particularly interesting. The beans are taken by the farmers in Chinese carts to the nearest villages and are there exchanged with the innkeepers, who are also the storekeepers, for cloth and the ordinary requirements of housekeeping, a certain percentage of the purchase-money being received in cash. The innkeepers take the beans to the larger towns, and there effect a bargain with the merchants, receiving in return supplies to replenish their stock. The merchants in their turn convey the produce to the principal distributing centres, such as Tiehling, Changchun, and there sell it to the innkeepers, who own large yards where, the beans are stored. The proportions of the business may be gauged from the fact that these yards are 20 or 30 acres in extent. The receptacles are curious bins called tuns, constructed of straw, each 120 ft high and capable holding 150 tons. The last pre-export stage of all is reached when they are sold to the local merchants in Dairen or Newchwang at so much per *dan* (480 lb). The currency in which the farmer deals is the *tiao* (equal to from *5d* to *6d).* The dealers in the ports pack their produce into gunny bags holding 187 lb, and the consignment is then ready for steamer.

"What the bean produces: The first process in the treatment of the bean is the extraction of the oil. The Chinese, with their loyalty to primitive methods, use a hand press which is not so satisfactory as the efficient machinery of the European merchants, and the latter obtain not only 6 per cent more oil, but from 3 to 4 per cent of butter-fat, which is used in the manufacture of confectionery. From 9 to 10 per cent of oil is extracted by the hand-press and 15 to 16 by machinery. The oil is of various samples, the refined article almost equalling in quality fine olive oil, while the crude article is used by the Chinese for food and lighting. From about forty-eight pounds of beans forty pounds of bean cake and between four and five pounds of oil are obtained, the extra weight being released during the steaming process in manufacture. The beans cost in Manchuria about 5*s* per picul (133 1/3 pounds). The oil is sold at 17*s* per picul and the bean cake at 2*s* 3*d* to 2*s* 6*d* per picul.

"The future of the beans: Towards the end of last season the railway carried 6,000 tons per day to the ports, and it is estimated that this year the amount will be increased by 1,000 tons daily. This looks like business and the merchants would tell you that the prospects are promising. The bean cake is an excellent fertilizer, and an inexpensive one, and might find its way in increasing thousands of tons into countries to which it has not hitherto been exported. But there are difficulties to contend with and possibilities to consider which make trading in beans somewhat of a gamble. The fluctuations in the price of silver may cause a difference in values of as much as 40 per cent in the short period elapsing between sale and delivery. There is also a lack of confidence, consequent upon there being so many rivals on the market as oil-producing seeds. These are problems which may be solved to the satisfaction of bean merchants, and if so, there is a great future for beans and their by-products in Europe and other parts of the world. So far as China and Japan are concerned it is certain that their demand will increase annually by material quantities, at any rate this would appear to be the belief of those interested in the business, judging from the extension of the area placed under cultivation."

204. *Advertiser (The) (Adelaide, South Australia).*1910. Milk from the soya bean. Jan. 11. p. 7.
• ***Summary:*** "The Japanese make a milk, said to be very nourishing, from the soya bean. The process is as follows:- The beans are first of all softened by soaking, and are then pressed and boiled in water. The resultant liquid is exactly similar to cow's milk in appearance, but is entirely different in composition. The soya bean milk contains 02.5 per cent. of water, 3.02 per cent. albuminoid, 2.13 per cent. fat, 0.03 per cent. fibre, 1.18 per cent. non-nitrogenous substances, and 0.41 per cent. ash. Some sugar and a little phosphate of potassium are added in order to prevent the elimination of albumen, and then the moisture is boiled down till a substance like condensed milk is obtained. This condensed vegetable milk is of a yellowish color, and has a very pleasant taste hardly to be distinguished from real cow's milk."

205. *Agricultural Gazette of New South Wales.*1910. Soy beans. 21(1):57. Jan.
• ***Summary:*** "Recently there have been numerous references in the agricultural press to the Soy bean or Soja bean as food for cattle and also for culinary purposes. The Commercial Commissioner in the East, Mr. F.D. Suttor, has furnished a very comprehensive report on the use of this bean and other varieties of the *Phaseolus* [sic] group in Japan.

"It is to feared, however, that so far as New South Wales is concerned, the cultivation of Soy beans is not likely to attract much attention. Experiments have been carried out at the various Experiment Farms for nearly twenty years [i.e., since about 1891-92], and trials on a large scale seem to indicate that however satisfactory these beans might prove in certain suitable districts, they are not likely to prove as profitable a crop for market as other pulses, such, for example, as Cowpeas, for which there is generally a pretty good demand...

"Mr. Suttor forwarded of seed, which have been distributed for trial."

"According to the *North British Agriculturist* some 50,000 tons of these beans were imported to Scotland from Manchuria last year for the manufacture of oil and cattle cake."

206. *Evening Post (Wellington, New Zealand).* 1910. Won by free trade. Feb. 12. p. 13.

• ***Summary:*** A powerful argument for Free Trade is furnished by an article in the *Shipping Gazette* dealing with the importation of soya beans. These are likely to provide freights to British ports from Manchuria to the extent of £1,250,000, this season, and it should be noted that they come to this country almost wholly because Continental nations put import duties upon them. The result is that we crush them and ship the oil to the Continent, thus reaping the triple benefit of import freights, work in this country, and export freights.

"'Business,' says the Gazette, 'so far as we ourselves are concerned, commenced with an importation in 1908-9 of not far short of half-a-million tons. This quantity represented practically the whole of the supply to the Western Hemisphere.

"'There is very little prospect of a removal of the duty in Continental ports, at any rate in the immediate future, and when it is remembered that the expectation regarding the coming season's importation from Manchuria is very largely in excess of that of the last, it will be realised what a good thing to British manufacturers of oil products and stock food is the absence of any handicap in the shape of an import duty, a freedom which is giving them a long start over any possible competitor.

"'The export of the soya bean has, it can scarcely be doubted, come to stay, and, judging from present conditions, for the good of the British trader and shipowner mainly. The development of Manchuria, commercially and financially, should therefore in the future be to a great extent in our hands. Here is a fine opening for the export of British capital.'"

207. *Ashburton Guardian (Canterbury, New Zealand).* 1910. Beans and freights. Feb. 16. p. 4.

• ***Summary:*** "It is strange to what impulses the recent improvement in the shipping outlook may be attributed. For instance, nobody would have imagined that the export of beans from Manchuria would have been on a scale of such magnitude as to give quite a fillip to freights by providing many cargoes and drawing ships away on long-distance voyages."

"One of its centres is the port of Dalny, and it is said that during the season which began in November, 1908, and closed in June, 1909, over 150,000 tens of beans were shipped thence to Europe, chiefly to Liverpool, Hull, and Bremen. During the same period 143,000 tons were shipped, from Vladivostock, of which more than one-half went to the United Kingdom."

"It is said that attention was first called to the soya bean when manufacturers of cottonseed oil found their supplies from India and Egypt falling short. This sort of thing is catching, and there is now an expectation that Central China will endeavour to compete with Manchuria for the European market. The more the merrier so far as the shipowner is concerned."

208. *Advertiser (The) (Adelaide, South Australia).* 1910. Shipping news. March 23. p. 8.

• ***Summary:*** "Then the remarkable development of the soya bean trade between Manchuria and Europe has similarly drawn a large amount of tonnage into another long-distance trade, and the activity of the Eastern markets during, the last three or four months has been notorious, giving shipowners the first chance they have had for many years of securing really profitable business."

209. *Sydney Mail (Australia).* 1910. Soy bean for stock: Report to the British Board of Trade. April 20. p. 12.

• ***Summary:*** "A fair idea of the growing importance of soy bean cake as a commercial feed in Europe is given in a recent report on the British trade by an expert. In his opinion, the growing demand for the soy bean has been caused in part by the recent rise in the price of cottonseed products... The reduced supply of Egyptian cotton seed for future requirements is expected to be made up by increased purchases in India. According to press reports British seed crushers have 400,000 tons of last season's crop of soy bean under contract."

"The total demand for soy oil and cake is good, the total British exports of cake to European countries for the 11 months ended November 30, 1909, being 70,000 tons. It is stated that large mills are to be built in Denmark which are expected to consume about 20,000 tons of beans annually in the manufacture of soy cake."

210. *Advertiser (The) (Adelaide, South Australia).* 1910. Monetary and commercial: Edible oils and the soya bean. April 27. p. 5.

• ***Summary:*** "During the past year there has been a considerable rise in the European values of all butter and lard substitutes. A correspondent of the 'Manchester Guardian,' recently discussing the question, called attention especially to the shortage of the olive and American cotton crops. Early last year the price of olive oil reached £65 per ton. When the new crop came in the price fell rapidly, but is now again approaching £50 per ton. The failure of the usual supply of cotton oil from America was perhaps more serious, as there is no generally recognised substitute for American cotton oil in the manufacture of edible fats. The dearth of cotton oil, however, stimulated manufacturers to seek new sources of supply. Although the attempt to utilise British makes of cotton oil does not appear to have met with very much success, there has been an important development in the introduction of 'Soya' oil.

"This oil is manufactured from the Manchurian bean of that name, and during the year 1909 no less than 360,000 tons of the bean (or more than half as much as the total quantity of cotton seed crushed in Great Britain) were imported into that country. The prospects for the future development of this trade are (says the "Economist") somewhat uncertain. As soon as an edible Soya oil has been manufactured the demand will doubtless be greatly stimulated, and even present prices, which are about 10/ a ton less than that of soapmaking qualities of cotton oil, are extremely profitable to the Manchurian agriculturist. On the other hand, the latter is handicapped by considerable natural difficulties in the way of transport. The question of tariffs is an important factor. That British manufacturers have so far been able to secure a partial monopoly of the trade is almost entirely, if not wholly, due to the absence of a tariff which in France and Germany is sufficiently high to shut out the raw material. If to the existing competition of China and Japan there were added that of America, Germany, and France serious results might follow. For one thing, the price of the Soya bean, which has already risen considerably, might be driven to a height which would seriously diminish the profits of British crushers when their present stocks were exhausted. For the moment, however, at existing prices for oil and cake they have a handsome margin of profit."

211. Bugby, William. 1910. A vegetarian's experiences. No II. The soy bean. *Daily Post (The) (Hobart, Tasmania, Australia).* April 30. p. 7.

• ***Summary:*** "There is a still better substitute for meat, and that is the Soy bean of Japan, which is now being extensively cultivated in New South Wales. The present writer has found nothing to surpass this most useful bean, and especially the improved variety of it grown at Wahroonga, N.S.W., by the Sanitarium Food Reform Co. [Seventh-day Adventist]. It might be introduced into Tasmania with advantage, and in a calcareous soil would prove a source of great profit to the grower. The Wahroonga variety of Soy bean takes less time to cook and is also more tender when cooked than that imported direct from Japan. It is far more digestible than any other kind of bean."

Note 1. In 1910 Wahroonga was a suburb of Sydney; it would have included some small, semi-rural market-gardening areas that provided vegetables for the city dwellers. The word "extensively" above probably means that small plots of soybeans were being grown in market gardens around towns and settlements in NSW. As of 2005 Sanitarium Food Reform Co. has been renamed Sanitarium Health Food Co. and is a thriving maker of health foods, breakfast cereals, meat alternatives, soymilk, etc.

"While the writer feels some satisfaction in the thought that more than 20 years ago [i.e., before April 1890], in the columns of a Melbourne journal, he was the first to call attention to the great merits of this most remarkable bean, and to advocate its introduction into Australia, he feels somewhat depressed at the fact that it has taken so many years to (?) its cultivation on and its adoption and recognition as an article of food. As a rule it may be assumed that it will take a generation to effect any great (?) reform. But we shall reap, if we faint not.

"The Soy bean is, in fact, a perfect and superior substitute for flesh meat, and it contains not only proteids or flesh-formers in abundance but also a large amount of pure and digestible fat. It contains the same food elements, in the same proportion, as a moderately fat mutton chop. Its skin is so thin as to be scarcely perceptible, hence it is the most digestible of the bean family, and can be flavored to suit any palate. It makes a highly nutritious soup. Children and invalids thrive upon it. The following is an analysis of the Soy bean -"

A table compares the "elementary constituents" of two varieties of soy beans, peas, lean beef, and fat mutton. For each is given the percentage composition of water, protein or nitrogenous matter, fat or hydro-carbon, carbo-hydrates (starches), fibre, and ash. The protein content is as follows: Soy bean #1–37.8%. Soy bean #2–34.0%. Peas 23.0%. Lean beef 19.0%. Fat mutton 12.0%.

"In cooking, the bean absorbs about four or five times its weight of water; this brings it closely up to an equal quantity of fat mutton. A glance at the above table will show that the Soy is superior in every respect to beef, and is only surpassed in starch by peas. Dr. Anna Kingsford, M.D., in her interesting book 'The Perfect Way in Diet' [about a vegetarian diet], has shown that the digestive organs of man are not fitted for animal food, and that such food causes irritation and increases the tendency to inflammation, and is also largely responsible for rheumatism, gout, and neuralgia. It also promotes phthisis [pulmonary tuberculosis]. The drowsiness felt by so many persons after a hearty meal of meat, together with an intense craving for stimulants [e.g., alcohol], is wholly unknown to vegetarians, and this is why, in London, the numerous vegetarian restaurants are thronged by bankers and brainy business men at the time of the midday meal.

"It is worthy of notice that the ox gives back in his meat only some of the food derived by him from the grass, retaining the balance to form his teeth, horns, hoofs and hide. So that, at best, man loses some of the best nutriment when he uses meat as food. In addition to this, in the venous blood of the animal are to be found poisonous and effete material, waste tissue, cadaveric alkaloids, and even parasites and disease-germs, wholly absent from vegetables and fruit. It is a rare thing for vegetarians to suffer from anaemia, though it must be supposed that even a diet so rich in all the elements the blood requires will of itself secure immunity from this and other diseases if other hygienic conditions are absent. A vegetarian diet is not a panacea, although those who adopt it suffer far less from all complaints than their meat-eating brothers and sisters. If a vegetarian lady, 'cumbered with much serving,' and beset with a multitude of household duties, keeps all day indoors and does not go out enough to exercise in direct sunlight and fresh air–and most women have too little of these–she will very likely become anaemic, like her meat-eating sister, but this is not because of her vegetarian diet, but in spite of it. Still, she will not suffer so badly, or become so 'run down,' as that meat-eating sister, and she will, moreover, make a much more rapid recovery from all her ailments.

"It is also quite possible for a vegetarian to eat too much nitrogenous food, and to suffer from consequent indigestion. Still, the diet is not responsible for a man's gluttony if he will eat to much, and will live to eat rather than live to eat. Temperance in eating is almost as essential as temperance in drinking. Here it may be added that a moderate and well-chose vegetarian diet is a certain cure for drunkenness, since the craving for intoxicants is mainly induced by the inflammatory state of the stomach caused by flesh-eating. Vegetable food is so nourishing and sustaining that a vegetarian can better afford to go without a meal than can a meat-eater. Indeed, the experience of the writer has been that for prolonged muscular and mental work there is nothing to compare with a judiciously-selected fruit and vegetable diet. The ancient Spartan and Roman athletes disdained meat. They lived on barley-cakes, olive oil, and black lentil soup. The canny and energetic Scotchman is virtually a vegetarian. The miners of Chili [Chile] are wont to ascend a perpendicular ladder with 2 cwt [1 cwt = hundredweight = 112 pounds] on their backs, and they do this all day long on a meal of beans and vegetables and fruit.

"The writer is of [the] opinion that after the age of three years milk should not be taken by human beings. It clogs his stomach, makes his brain sluggish and stupid, and in the stomach gives rise to lactic acid complications. Hence it should never be forced upon children over three years of age who have come of gouty or rheumatic parents. As a rule, such children have a natural detestation of it and a great aversion to it. Cow's milk is an abomination that ought never to be taken. It is an unnatural thing for a human being that has cut its teeth, and ought to eat solid food, to drink the milk of a brute! The human stomach resents it!"

The writer then discusses: Suitable foods for vegetarians. The benefits of eating two meals a day. The importance of understanding the "elements of nutrition" contained in each food to maintain one's proper weight and good health, the ability of a given area of land to support 6 times as many vegetarians as meat-eaters, the need to divide large Tasmanian land holdings into small plots of orchards and kitchen gardens, the sustaining and invigorating power of a non-flesh diet, the overall physical, mental, and moral effects of a vegetarian diet, and the need to abolish abattoirs or slaughter houses.

"It is not sufficiently understood that a vegetarian has far higher motives that the gratification of his palate and the satisfaction of his appetite. He regards all life as sacred, and the taking of innocent animal life as a monstrous crime, both against the animal and its right to live, and against the moral development of society at large. He regards his Creator as the Creator and Father of every living thing. When his last hour comes the vegetarian will be able calmly to meet his Heavenly Father–the Father also of every poor dumb animal–with the happy though humble consciousness that he has neither knowingly caused the infliction of pain or death, nor connived in their infliction by others upon an innocent animal. There is sound sense in the lines: -

"'He prayeth best who loveth best
All things both great and small;
For the dear God who loveth us,
He made and loveth all.'"

Source of poem: "Rime of the Ancient Mariner," by Samuel Taylor Coleridge (1798; Part VII, stanza 23). Coleridge lived 1772-1834

Note 2. This is the earliest document seen (May 2005) concerning soy beans in connection with (but not yet in) Tasmania.

Note 3. The author may have been a Seventh-day Adventist, since he states that soybeans have been grown in the Sanitarium gardens at Wahroonga, New South Wales. If he was an Adventist, this would be the earliest article seen on soybeans written by a Seventh-day Adventist. Address: Tasmania.

212. *Advertiser (The) (Adelaide, South Australia).* 1910. The Suez Canal: A profitable year. May 30. p. 11.
• ***Summary:*** "London, May 29. The profits of the Suez Canal for the past year amounted to £4,930,000. This is a record, and is due to the increased traffic in Indian wheat and the Manchurian soya bean, also the increased shipping trade of Australia and Japan."

213. *Evening Post (Wellington, New Zealand).* 1910. Agricultural affairs. June 11. p. 12.

• ***Summary:*** "Amongst the exhibits at the Dunedin Winter Show was the Soya bean, grown by Dr. Gow, of Sunnyside, Canterbury.:

Note: Dunedin is the second-largest city in the South Island of New Zealand, and the principal city of the region of Otago. Sunnyside is a city in the Canterbury region of the South Island, just north of the Otago region.

"The bean is described as a new fodder plant. As this it is naturally little known in this capacity in its native element in Asia, but where it has been tried it is generally admitted to be an excellent milk-producer. The Soya bean, says a Southland paper, might with advantage be cultivated in New Zealand. Apart from its value as an oil-yielding legume, its value as a fertiliser and a fodder should recommend it in a country where winter feed is periodically scarce."

"The Manchurian bean evidently I has a great future, and it will be surprising if Dr. Gow's example is not followed by a number of agriculturists in Now Zealand."

214. *Agricultural Gazette of New South Wales.*1910. Soy beans. 21(7):576. July 2. [2 ref]

• ***Summary:*** "As far back as 1893 Mr. G. Valder found that a variety known as 'Improved White,' imported from the United States, yielded at the rate of 47 bushels of dry pulse per acre (see *Agricultural Gazette,* Vol. IV, 1983, page 915)." Soy beans were found to thrive less well than cowpeas.

"'On paper' there is no question about the value of soy beans as a farmer's crop. American experience is that compared with cowpeas they are more valuable as a grain producer, whether to be pastured or threshed. They are hardier and more drought resistant; they can be grown earlier and later in the season, thus ensuring a longer succession of feed; and they produce a grain much richer in protein, or muscle-producing constituents, being the richest of all natural vegetable foods. In Henry's "Feeds and Feeding," the protein contents of soy bean and cowpea seed are given as 34-0 and 20-S per cent respectively.

"Whilst cowpeas are extensively grown in New South Wales as a soiling or grazing crop and soil renovator, soy beans have not taken the place in cultivation which their value would seem to warrant."

At Hawkesbury Agricultural College the plants and beans have been found of great value as fodder for cattle and pigs. "Soy beans are also a delicious table vegetable, if shelled whilst quite green, and the plants, after the pods are taken off, make very good feed for cattle.

"As we are still importers of pulses, soy beans seem to be worth further trial, and farmers are advised to test them in a small way to see if the district suits them." Address: Australia.

215. *Agricultural Gazette of New South Wales.*1910. Soy beans. 21(7):576. July.

• ***Summary:*** "'On paper' there is no question about the value of soy beans as a farmer's crop. American experience is that compared with cowpeas they are more valuable as a grain producer, whether they be pastured or threshed."

"While cowpeas are extensively grown in New South Wales as a soiling or grazing crop and soil renovator, soy beans have not taken the place in cultivation which their value would seem to warrant. For some unexplained reason the legume has not shown that it will thrive over such an extent off the State as cowpeas, though experiments conducted by the Department on a large scale have shown that it will prove a good crop for farmers in suitable districts to grow for their own use. As far back as 1893 Mr. G. Valder found that a variety known as 'Improved White,' imported from the United States, yielded at the rate of 47 bushels of dry pulse per acre (see *Agricultural Gazette,* Vol. IV, 1893, page 915)."

"Soy beans are also a delicious table vegetable, if shelled whilst quite green, and the plants, after the pods are taken off, make very good feed for cattle.

"As we are still importers of pulses, soy beans seem to be worth further trial, and farmers are advised to test them in a small way to see if the district suits them."

216. *Hawera & Normanby Star (Taranaki, New Zealand).*1910. Second sight. Aug. 2. p. 7.

• ***Summary:*** "A new element is to be introduced into farming in South Canterbury in the introduction of the soya bean, which is little known here although extensively grown in some parts of the world. Mr G.L. Twentyman, of Seadown, who for years has successfully cultivated field peas, and found them a very payable crop, has just imported a consignment of the soya bean, and intends to sow it in his farm in the coming spring.

"In addition to the bean being a useful article of food, it is also valuable for the oil which it yields."

217. Kushigata Shoyu Jozosho (The "Kushigata" brand soy brewery.) Main office: Noda, Chiba Prefecture (Document part). 1910. In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 165-67. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "History: As will be seen by the accompanying articles, most of the soy brewers of Noda are distinguished by the surname of Mogi, and the family of Mr. Hichizayemon [Shichizaemon, Hichizaemon] Mogi, proprietor of the firm of 'Kushigata' brand soy is, in fact, the head and originator of all these distinguished so brewing firms of the same name. One of the ancestors of the Mogi family was a distinguished Samurai in the service of the celebrated warrior and statesman–Toyotomi Hideyoshi–and his daring and deeds of valour are matters of history. With the overthrow of the Toyotomi family he laid aside his sword and entered the field of business. It was 290 years ago that the founder of the firm, the ancestor of Mr. Hichizayemon Mogi settled in Noda as a soy brewer. His distinguished personality and lineage gained for him the deep respect of the inhabitants and he was appointed the headman of the place, thus being called upon to engage in public business as well as his own. At this period, soy was brought over from Osaka to Tokyo, the capital of the Tokugawa Shoguns. The quality of this sauce, however, was very inferior and in view of this Mr. Mogi instructed a member of this branch of the family–Mr. Saheiji Mogi–to brew the 'Kikkôman' soy as an experiment. The results having proved very satisfactory, that brand was brewed on a large scale, and Mr. Mogi subsequently inaugurated the brewing of the 'Kihaku' brand, the two firms being allowed to engage in the brewing of so-called Noda Soy on an extensive scale. These two brands of soy having proved very well suited to the tastes of the citizens of Yedo, the demand increased to such an extent that the output was hardly sufficient to meet the demand. Such being the case, Mr. Hichizayemon Mogi himself engaged in the brewing of soy also. The ripe experience gained by supervising the work of the branch firms in brewing superior varieties of soy proved very valuable to him, and his business also proved a very great success, the name of the new brand of soy 'Ichiyama' becoming quite celebrated within a comparatively short period of time. However, another new branch of the Mogi family's firm being inaugurated under the proprietor-ship of Mr. Yuyemon Mogi, the brand 'Ichiyama' was transferred to the new firm so as to ensure its prosperity and the brand 'Kushigata,' at present in use, was then adopted. Such proceeding may appear somewhat strange, but it was in compliance with the legacy left by the ancestors of the Mogi family that the various branches should unite for the general sharing of profits in their business undertakings. At the time when the fame of the 'Kushigata' brand was at its height, in 1871, the whole premises of firm were unfortunately destroyed by fire. This proved a great blow to the fortunes of the firm but the present proprietor, by dint of sheer energy and perseverance, succeeded in retrieving the lost fortunes of the firm, the yearly output at present far exceeding the former production. Although the yearly output of the main house of Mogi ('Kushigata' brand soy) is below that of the branches, namely the 'Kihaku' and other brands, it has been entirely owing to the good will of the former that the latter firms have been enabled to attain their present prosperous state, the outcome of the traditional legacy of the Mogi family having been carried out by the head of the house

"Present conditions: The firm has at present two factories, the number of hands employed being 600. The factories are provided with two sets of boilers and steam engines for motive power. The firm produced about 5,270,000 gallons of soy per year, of which about 336,000 gallons are exported to foreign countries, the places of destination being Hawaii, Australia, China, Korea, Canada, British Columbia, the United States, the Philippine Islands, and the Straits Settlements [today's Singapore]. The export trade shows a tendency to increase year by year.

"Honours Awarded: The following are some of the principal prizes and medals awarded to the 'Kushigata' brand soy at the various exhibitions where the firm's products have been shown:–The National Industrial Exhibition from the First to the Fifth. First Prize on each occasion. International [Columbian] Exposition held in Chicago [Illinois], 1893. Gold Medal. International Exhibition held in Paris, 1899. Gold Medal. St. Louis International Exposition [Missouri], 1904. Grand Prix. Alaska-Yukon International Exposition at Seattle, 1908. Grand Prix.

"Proprietor: The present proprietor of the famous firm of the 'Kushigata' brand is Mr. Hichizayemon Mogi, who is the eleventh of the line. Although he is yet young, he places business before pleasure, strictly adhering to the precepts of his ancestors and is devoting his entire energy to the development of his business and the improvement of the particular brand for which the firm is responsible. Having selected a most favourable locality he is, at present, constructing a new factory with the producing capacity of 2,000,000 gallons per year, which promises to be the best equipped factory of its kind in Japan. The machinery employed is to be of the latest pattern, and it is intended that electricity be used as the motive power."

A photo (p. 166) shows "The pumping machinery of soy." Around the pump are many brick walls. Address: Japan.

218. Yamasa Shoyu Jozosho (The "Yamasa" brand soy brewery.) Main office: Choshi, Chiba Prefecture (Document part). 1910. In: Japan's Industries: And Who's Who in Japan. 1910. Osaka, Japan: Industrial Japan. vi, iii, 687 p., iv p. See p. 156-58. Undated. Translated from unpublished Japanese manuscripts. 29 cm. [Eng]

• ***Summary:*** "History: The Hamaguchi Soy Company, which was formed in 1906, with a capital of ¥500,000, is the continuation of a very old firm founded 265 years ago [i.e., in about 1641] by the brothers Kichiyemon and Gihei Hamaguchi, ancestors of the present Mr. Kichiyemon Hamaguchi, the proprietor of the firm. These two brothers, natives of what is now Wakayama Prefecture, settled down in Chôshi, and opened a soy brewery, which has gone on progressing from that day to this. In 1825, the Yamasa brand was one of those accorded the privilege of being called "The Best Soy" by the Tokugawa Shogunate. Mr. Goryo Hamaguchi, the father of the present proprietor, after a visit to Europe and America, in 1833, introduced some radical changes in the brewing of soy in his brewery, by an application of the most scientific principles. Mr.

Kichiyemon Hamaguchi, the present head of the firm, continued the same enterprising policy of his father, and the business began to extend very much in consequence. In 1894 the firm was appointed supplier of soy to the Imperial Household by special warrant. On being transformed into a partnership concern, the business of the firm increased considerably, while experts were engaged to conduct scientific investigations. Dr. Kendo Saito, the well-known scientist, was entrusted with the study of soy fermentation.

"At present the firm owns two breweries, installed with steam plants, and employing over 600 hands. The annual output is approximately 8,000,000 gallons. Tokyo, Yokohama, and other large business centres, consume great quantities of the 'Yamasa' brand, and much of it is exported to Great Britain, the United States, Germany, Australia, China, Korea, Hawaii, and Vladiovstock. The soy which goes abroad is contained in bottles of artistic appearance, well packed in boxes. The Hamaguchi Company was the pioneer in the export trade of soy, this being due to Mr. Goryo Hamaguchi's tour in 1883, when he made a special study of the foreign taste for the Japanese sauce.

"As above mentioned, 'Yamasa' brand soy is supplied to the Imperial Household by special warrant. A great honour was done the firm when His Highness Prince Kan-in, the President of the Fifth National Industrial Exhibition, paid a visit of inspection to the brewery. In 1907 their Imperial Highnesses, Princes Kitashirakawa and Higashikuni went over the brewery, and made some observations highly complimentary to the proprietor. In the same year a further honour was done the proprietor, when he was appointed supplier of 'Yamasa' soy to His Imperial Highness the Crown Prince of Korea.

"Space does not permit of a full list of the prizes won by the company at various exhibitions. 'Yamasa' brand soy was awarded a first prize at every one of the five National Exhibitions which have been held in Japan. Abroad, either a gold medal or the Grand Prix was awarded at each of the following Exhibitions: Chicago [Illinois/Columbian] International Exposition, 1893; Paris International Exhibition, 1899; The Asia Exhibition (Hanoi, French Indo-China), 1903; St. Louis [Missouri] International Exposition, 1904; Milan Exhibition [Italy], 1905; and Seattle Exhibition, 1909.

"Mr. Kichiyemon Hamaguchi, the President of the company, was born in Wakayama Prefecture in 1862, and was educated at Keio University. In 1960 he made a tour round the world, and since his return has done much to assist in extending the nation's commerce and industry. In order to enlarge his business he converted it into a company, and owing in great part to his energy and enterprising spirit, the company has proved a conspicuous success. Indeed, the whole soy industry has profited by his labours. A gentleman of excellent character and reputation, he has sat in both Houses of the Legislature. Mr. Hamaguchi has been ably assisted in his work by Mr. Kichibei Hamaguchi, a director, and Mr. Tetsujiro Midzushima, the superintendent of the works, as well as by an industrious and efficient staff."

Photos show: Yamasa soy in casks and bottles. Yamasa brand soy brewery from an angled aerial view; smoke rises from two tall smokestacks. Address: Japan.

219. *Argus (The) (Melbourne, Victoria, Australia).*1910. The soya bean. Oct. 12. p. 11.
• ***Summary:*** "Although the cultivation of Soya beans has in past years not proved satisfactory as a farm industry in Victoria Mr. J.M.B. Connor, Agricultural superintendent, has hopes that the department's present season's efforts to popularise this crop will mark a distinct epoch in its history in this country.

"'The trouble has not been climatic in the past,' he says 'but improper treatment, for if the seed be sown or planted more than an inch and a half deep it is not likely to germinate.' The whole of the 4.5 tons of seed recently imported from the East for distribution among the farmers at cost price (6/6 per bushel of 60 lb.) has been applied for in lots varying from 2 lb. to 15 bushels, 95 growers having been supplied. The seed may be sown from early spring until midsummer. The Soya bean makes an excellent food for cattle and pigs, the hay being equal in feeding results to lucerne hay, while if grown with cow peas a splendid mixture is secured. As a pasturage food for pigs it is also very profitable. Growing Soya beans for the grain for use as feed is distinctly profitable if the yield is more than 10 bushels per acre, the feeding value being superior to that of cotton-cake. The grain is rich in protein, and contains 18 per cent of oil."

220. *Colonist (Nelson, New Zealand).*1910. Farm topics. Oct. 27. p. 1.
• ***Summary:*** "The soya bean is a native of China and Japan, where it has been used for centuries, as a human food. It stands drought well, and the grain is a richer food than linseed meal. It enriches the soil on which it is grown. The soya bean is a warm weather plant, and must not be sown till the ground gets well warmed up.

"It is being tried on a small scale in South Canterbury [New Zealand] this season so that we shall probably soon know something more than we do of its suitability to our land and climate."

Note: Canterbury is a region of New Zealand on the west coast of the South Island. It is New Zealand's largest region by area. Its main city is Christchurch.

"It is not fed to stock in New Zealand to any great extent. Probably the most that is done in that way is in the feeding of calves with boiled linseed. The chief reason for the advance it is said is a shortage of hogs and from the poor linseed and cotton crops, combined with a very large demand in that country [UK] for all oils. The same shortage has been experienced in Northern Argentina, perhaps the greatest of the linseed producing areas. Then, again, the cotton crop in the United States is not very favourably reported upon. So far in India the prospects [for cotton] are good."

221. *Evening Post (Wellington, New Zealand).* 1910. News and notes. Oct. 29. p. 12.
• ***Summary:*** "According to the *Australasian*, 'agricultural high schools have been established at Ballarat, Sale, Shepparton, Warrnambool, and Wangaratta, these being under the joint supervision of the Education and Agricultural Departments. The latter department is now engaged in the session's work of instructing the pupils how to put in certain experimental crops. The field branch superintendent, Mr. J.M.B. Connor, was at Wangaratta last week, having gone to select a site for the fodder maize plots, which will be sown by the boys during the present week. The varieties of seed chosen, five in number, are those deemed to be best suited to the district; a plot of soya beans will also be sown. Mr. Connor, on his return, stated that he was highly pleased with the condition of the farm generally, which is under the management of Mr. George Gordon.'"

222. *Daily Post (Australia).* 1910. On the land: A column for rural producers. Growing importance of soya bean trade. Nov. 29. p. 3.
• ***Summary:*** "The extraordinary development of the export of Manchurian [soya] beans to Europe which began in the autumn of 1908 is considered by the British Commercial Attache at Pekin to form the most marked feature of the trade of China during the last year. It is a trade of special interest to us, as the United Kingdom, in consequence of the high import tariff of other countries, enjoyed practically a monopoly of the shipments, although we believe that both Germany and France have now arranged to admit the beans free of duty or at a much reduced tariff.

"In the meantime, British oil crushing industries have derived much profit from the large importations of the beans, being made to a great extent independent of the scarce supplies of cotton seed, linseed seed, etc., and the cake made from the crushed residue has provided an excellent cattle cake.

"During the last complete shipping season, from November 1908 to September 1909, as many as 34 steamers loaded cargoes of the beans, and the shipments for the year which ended last December was 234,000 tons from one port, shipped by British and Japanese firms. The total shipments to Europe from Manchuria in 1909 amounted to about 548,000 tons, and in Japan it is estimated that 294,000 tons were exported.

"The purchase of beans in the interior of the country is said to be an operation involving no small difficulty and financial risk. The effect of the keen competition which naturally followed the successful business of 1908-09 was to raise the price of beans, and difficulties were experienced in getting deliveries in accordance with contracts fixed when prices were low. The business lends itself to gambling, and large sums are said to have been lost by the less fortunate speculators.

"In the report of his Majesty's Consul at Newchwang on the trade of the port for 1909 will be found an estimate an estimate of the total production of [soya] beans in South Manchuria, based upon the amounts of beans and bean cake exported from Newchwang and Dairen. The conclusion is reached that these exports represent a total of 1,333,000 tons of beans, and that the production under favorable conditions can be estimated at not far short of 1,480,000 tons."

223. *Daily Consular and Trade Reports (U.S. Bureau of Manufactures, Department of Commerce and Labor).* 1910. Soya-bean cultivation in Australia. 13(139):1014. Dec. 15.
• ***Summary:*** "Consul John F. Jewell, of Melbourne, reports that the superintendent of agriculture recently imported 4½ tons of soya-bean seed from the East for distribution, at cost price, among the farmers of Victoria, and that it has been furnished them, with instructions relative to cultivation and its value as cattle and hog feed, in quantities varying between 2 pounds and 15 bushels, 95 growers having applied therefor." Address: Washington, DC.

224. Liardet, C.E. 1910. Soya beans. *Queensland Agricultural Journal* 25(6):261-67. Dec. Continued, Jan. 1911. [1 ref]
• ***Summary:*** Note: This article is reprinted from a 27-page booklet compiled by Mr. Liardet, titled *Soya Beans*, and published in 1910 by the Northern Publishing Co. (Liverpool, England)–which see.

"We receive so many inquiries concerning Soya beans from all parts of the State that we hail with great pleasure the publication of an exhaustive treatise on the subject by Mr. C. E. Liardet, China. In the interests of our farmers, we have taken the liberty of publishing in the Journal the most essential portions of the treatise..." An illustration (non-original line drawing; facing p. 262) shows a typical Soya Bean Plant, with pods and nodules. Address: China.

225. *Daily Post (Australia).* 1911. Soya bean cake. Jan. 4. p. 3.
• ***Summary:*** "An experiment extending over eighteen weeks has been made by the authorities of the Edinburgh and East of Scotland Agricultural College to test the value of soya bean cake, and one of the conclusions arrived at is that the poorer the cake is in oil, the better are the results obtained from its use. This is a point that users of this class of cake

should watch to see if it is confirmed by their experience. The general conclusions formed by the test are as follows: -

"1. That soya bean cake is a perfectly safe food when used with discretion, but not withstanding its high analysis ordinary soya bean cake at £6/15 per ton seems to be a dearer feeding stuff than good linseed cake at £9.

"2. That the poorer the soya bean cake is in oil, the better are the results obtained, and when the increased cost of the richer cake is taken into consideration, the results are much in favor of the soya bean cake with least oil. As the same amount of oil in linseed cake gave good results, it would seem that the unsatisfactory results obtained with the soya bean are due to some property of the oil in this food."

226. Liardet, C.E. 1911. Soya beans (continued). *Queensland Agricultural Journal* 26:9-15. Jan. + 2 plates before p. 9.
• ***Summary:*** Note: This is the continuation of an article is reprinted from a 27-page booklet compiled by Mr. Liardet, titled *Soya Beans*, and published in 1910 by the Northern Publishing Co. (Liverpool, England)–which see. The contents begins with: Soya beans in rotation. Feeding value of soya beans. Feeding value for sheep. etc. Photos show: A field of soya beans. Seven varieties of soya bean pods and seeds. Address: China.

227. *Advertiser (The) (Adelaide, South Australia).* 1911. To the Antarctic: The Japanese expedition. Feb. 10. p. 7.
• ***Summary:*** "Wellington [New Zealand], February 9. Further acquaintance with the Japanese exploring party confirms the first impression that they are a hardy, lot of men, not likely to be deterred in any task they may attempt... their food supply is certainly in odd contrast to the enormous quantities of provender carried southward by Scott and Shackleton. The list of goods aboard, as supplied to the Customs, comprises 90 bushels of rice, 90 bags of flour, 3 bushels of wheat, 40 dozen of canned meat, 143 cases of takuwanzuke [takuan-zuke], 4 sacks of soya beans, 3 dozen boxes of bread, 4 of butter, and 12 cases of pickled plums [umeboshi]. These are the leading items,... There is very little liquor aboard."

Note 1. This expedition reached Antarctica, and with them the first soybeans arrived in Antarctica.

Note 2. This was the expedition of Nobu Shirase in the Kainan Maru. From Wellington they sailed to Sydney, and from there they set off to Antarctica. For details see www.south-pole.com.

228. *Argus (The) (Melbourne, Victoria, Australia).* 1911. Soya beans. March 7. p. 10.
• ***Summary:*** "Experimental plots of Soya beans were sown last season in Various parts of Victoria under the direction of J.M.B. Connor, agricultural superintendent, and the reports to hand in regard to many of the crops are of a satisfactory nature. In the majority of cases abundant growth has been made, the plants having reached to heights of from 4ft. to 5ft., the show of bean pods being very heavy. The weights of plants grown upon measured areas have been carefully recorded and estimated, and the results show the growth to have been equal to 10 to 12 tons of green fodder to the acre; this, according to Mr. Connor, being an excellent food for dairy cows and other stock. The seed from which the crops were grown was imported last year by the Department of Agriculture, and on its arrival Mr. Connor picked out a number of seeds of different kinds of Soya beans for the purpose of sowing them separately for seed production. The varieties were Guelip [Guelph] and Itosan [Ito-san] (oil producers) and Baird and Brownie (forage kinds). From the several plots devoted to these varieties fair supplies of seed for the next season are expected. Mr. Connor recommends the use of the fodder kinds in conjunction with Westernwolth's ryegrass, lucerne, maize, peas, tick beans, barley, and oats, which will give a succession of green fodder to cows all the year round."

229. *Otautau Standard and Wallace County Chronicle (Otago, New Zealand).* 1911. England's record year. March 7. p. 7.
• ***Summary:*** "With the publication of the December figures the Board of Trade complete their record of the country's Overseas trade in 1910." A table shows the total value of the UK's foreign and colonial trade for the past five years (1906-1910) in millions of pounds sterling. In 1910 imports were worth a record £678 million, less re-exports [exports of imported products] of £103 million gives net imports of £575 million.

The section titled "Raw materials" states: "Soya beans, a comparatively new trade, which has brought a good deal activity to Hull, were imported to the value of £3,047,038."

230. Bugby, William. 1911. Soy beans as human food. *Vegetarian Messenger and Health Review (Manchester, England).* March. p. 83-84 (Series 8, 63d year). Reprinted from the Daily Post (Australia). [2 ref]
• ***Summary:*** "For some time past there has been a growing demand for a substitute for animal food that should be at once palatable, nutritious, and digestible, as well as easily cooked and moderate in price. Such an article of diet is furnished in the Soya, Soja, or Soy bean of China and Japan...

"In an article on 'A Vegetarian's Experiences,' in this paper, some months ago, by the present writer, a very brief account of this remarkable bean was given" accompanied by a table showing the nutritional composition of two soy bean samples compared with peas, lean beef, and fat mutton. The soy beans are much higher in protein, containing 34.0 to 38.8%.

The soy bean "has greatly improved in quality and flavor since its introduction to Australia; the beans produced at the [Seventh-day Adventist] Sanitarium gardens at Wahroonga, New South Wales, have also thinner skins, and are consequently much more easily cooked.

"The present writer does not pretend to be a gardener, but since his former article appeared, he himself has succeeded in growing the Soy bean in Tasmania. Although sown as late as October 24th, the beans survived a very sudden and severe frost, just after they had appeared above the ground. The plants are doing remarkably well, and are now developing rapidly. They evidently find the Tasmanian climate highly favorable to them. The beans thus sown came originally from the Wahroonga Sanitarium in New South Wales.

"The true economy, therefore–quite apart from the moral advantage of a non-flesh diet–is to use the Soy bean itself direct, as a perfect and superior substitute for flesh meat.

"As the writer is frequently asked how the Soy bean should be cooked, the recipe is here given:–Take a large breakfast cupful of Soy beans, place them in a basin, over them pour enough boiling water to cover them, and leave them to soak for one hour. Then boil gently for 2 hours. Like other beans they require flavouring with salt, mint, celery seed, mushroom ketchup, tomato sauce, or a slice of onion."

Note 1. This is the earliest document seen (May 2005) concerning soybeans in Tasmania or the cultivation of soybeans in Tasmania.

Note 2. This is the earliest English-language document seen (April 2008) with the term "human food" in the title, referring to soy beans. Address: Tasmania.

231. *Evening Post (Wellington, New Zealand).* 1911. Agricultural affairs. April 8. p. 12.

• ***Summary:*** "The soya bean boom still continues. A London paper has a communication from a correspondent in Manchuria, who says: 'You cannot open a newspaper in the Far East without your eye falling on the words "soya bean." People now come from England and other distant countries to get supplies of the beans at the season of their collection, and the leading banks of both Russia and Japan have established branches in Manchuria for the sole purpose of financing soya bean operations. One bean mill after another is erected, and for freight alone to Europe many thousands of pounds are sent annually. The history of the rise of this particular industry is without doubt a title to fame for the enterprising spirit of the Japanese banking houses [sic, house], Mitsui and Co.'"

232. *Grey River Argus (West Coast, New Zealand).* 1911. The way of the case. April 10. p. 2.

• ***Summary:*** "Mainly as a result of a large demand for disinfectants for plague stricken Manchuria, the price of carbolic acid has been advanced 50 per cent. The export of soya beans has also been seriously affected by the pestilence, and this means higher prices for soya oil, and also for linseed and other oils, which will have to take the place of soya oil."

233. Moira, -. 1911. Royal Agricultural Society: Record success of the Easter show. *Sydney Mail (Australia).* April 19. p. 4-5.

• ***Summary:*** "The prosperity of the country has been reflected in the Sydney Royal Show."

The section titled "Government farm exhibits" states: "The principal exhibits in maize have come from the Grafton Experimental Farm... Alongside the maize is an exhibit of leguminous crops, the principal shown being Florida Velvet bean, Cow peas, and Soy beans. The growth of these crops has been found to vastly improve land for maize and potato growing, as well as for fodder crops for dairy cattle, these being the principal industries of the Clarence."

234. *Poverty Bay Herald (Gisborne, New Zealand).* 1911. The soya bean. April 22. p. 2.

• ***Summary:*** "Will the soya bean 'boom' extend to Victoria? [Australia], asks the *Age* [an Australian periodical]. Present indications are that it will. In the meantime the bean is here [in New Zealand], if not the 'boom,' and the plant is thriving remarkably well. Last year the Department of Agriculture obtained four tons of the seed from Shanghai, and planted some on its experimental plot at Cheltenham, where the bean attained a height of five feet on sandy soil, one variety yielding 13 tons and another 12 tons to the acre."

Note: Cheltenham is located just southeast of North Shore City, in the Auckland region of New Zealand's North Island."

"On different soil at Ballarat [a city in central Victoria, Australia] an even more vigorous growth is shown. Mr. J.M.B. Connor, Superintendent of Agriculture, said recently that he considered the plant greatly benefited the soil by the nitrogen which the nodules extracted from the air. The uses of the soya bean are manifold. A Chinese in Victoria was handed a parcel of the beans to convert them into merchantable goods. He made them into bottled preparations known as soya milk, soya currants, soya cheese [tofu], straws for making soup and soya curd, which the Japanese use as a cure for sciatica.

"In Manchuria it is primarily utilised for its oil extract and the manufacture of cake. The *London Times* reports that soya beans are now one of the principal imports of Hull, and are likely to seriously affect the importation of cotton seed. Their value is widely recognised by soap makers. The first commercial crop was sent to Europe [from Manchuria] in 1906, and the requirements from Manchuria for the coming season are estimated at 1,000,000 tons, worth £6,500,000. That Victorian farmers are alive to the possibilities of the soya bean is shown by the fact that Mr. Connor disposed of two tons and a half of the seed in small lots in one day."

Note: The meaning of "soya currants" and of "straws for making soup" is unclear.

235. Bontoux, Emile. 1911. Le Soja et ses dérivés [The soybean and its products]. *Matieres Grasses (Les) (Paris)* 4(36):2195-99. April 25; 4(37):2239-43. May 25; 4(39):2326-29. July 25; 4(40):2364-66. Aug. 25; 4(41):2405-07. Sept. 25. [48 ref. Fre]

• ***Summary:*** Contents. Introduction. The plant: origin and history, species and varieties, culture, and production: USA, Japan, Manchuria, France, England, China, Korea, Indochina (it is cultivated for the needs of the population in Cochin China {especially in the provinces of Chaudoc and Baria}, Annam, Tonkin, Cambodia), Formosa, Java, India, Africa. The soybean–a food plant: The plant, the seed, large table showing many analyses from many countries of the chemical composition of many soybean seed varieties.

Introduction to food products made from soybeans in East Asia. Shoyu [soy sauce] (and koji). Miso. Natto. Tao-yu. Tao-tjiung (doujiang, from China). Tuong (from Annam). Tofu. Li Yu-ying. Table showing composition of powdered soymilk, fresh tofu, and soy flour.

The soybean–an oilseed plant. The soybean as an oilseed in the Far East. Table showing exports of soybean cake and oil from various Manchurian and Chinese ports in 1908 and 1909. The soybean as an oilseed in Europe and the United States. Table showing imports of soybeans to various British ports in 1909 and 1910 (the leading port by far is Hull, followed in 1909 by Liverpool, London, Bristol Channel, Scotland, and Other ports {Rochester, etc.}). Table showing exports of soy oil from Great Britain in 1910: To Germany, Austria, Australia, USA, Belgium, Denmark, Egypt, France, Holland, Italy, the Indies *(Indes)*, Norway, Russia, Sweden, other, total (115,372 barrels, each weighing 175 kg). Discussion of soy oil and cake in most of the above countries.

Trade in soybean seeds: Mitsui Bussan, Manchuria, England, China, Japan. Soybean cake.

Soy oil: Physical and chemical properties. Applications and uses as food and in industry: Margarine, for illumination, soaps, as a drying oil, paints and varnishes, linoleum, artificial rubber. An extensive bibliography is at the end of the last article in the series.

Note: This is the earliest document seen (Sept. 2003) concerning the cultivation of soybeans in Cambodia. This document contains the earliest date seen for the cultivation of soybeans in Cambodia (April 1911). Earlier documents imply that soybeans were being cultivated in Cambodia by 1900, and it is highly likely that they were being cultivated for at least a century before that time. Address: Ingénieur-chimiste E.C.I.L., France.

236. *Mercury (The) (Hobart, Tasmania, Australia)*. 1911. Business notices: The Tasmanian Mail (Ad). April 27. p. 1.

• ***Summary:*** Thursday, April 27. "Eight pages of illustrations." One section is titled "Sample of the soya bean" [or perhaps this April 27 issue of the publication contains a sample of a real soya bean!].

"Tasmania's largest and best illustrated journal."

This same ad appeared in the April 28 issue (p. 1) and the May 1 issue (p. 1) of *The Mercury*.

237. *Poverty Bay Herald (Gisborne, New Zealand)*. 1911. A British hero. May 3. p. 8.

• ***Summary:*** "A tragic incident of the plague outbreak in Manchuria was the death of Dr. A.F. Jackson, a young missionary, who had not long previously left his home in Cheshire. The first indication of the coming of the plague was an announcement that sickness had appeared among a trainload of coolies on their way to the Pekin district. The coolies had been harvesting the soya bean in Manchuria, and were returning to their homes when the trouble began. They were not allowed to cross the border, and on January 15 the terrified men, several hundreds in number, were placed under the charge of Dr. Jackson by the Viceroy, a Manchu of the modern school. Five Chinese inns were confiscated hurriedly and used as segregation barracks,..."

Dr. Jackson treated the coolies selflessly, one by one, but they died rapidly from the virulence of the disease. After the number of deaths had reached 80, he himself fell victim. The Viceroy gave a simple but beautiful speech at his burial.

238. *Evening Post (Wellington, New Zealand)*. 1911. Local and general. May 4. p. 6.

• ***Summary:*** "Mr. Thoreau, of Fairview, Canterbury, has been successful in cultivating the soya bean. Several other South Canterbury farmers have tried to grow this bean, but were unsuccessful, and it was generally considered (states the *Timaru Herald)* that the climate here was not sufficiently hot for it. Mr. Thoreau has proved the fallacy of this. Stock eat the bean with great avidity, Mr. Thoreau says, preferring it to other food. His crop matured well, and he is saving his own seed for planting next season."

239. *Grey River Argus (West Coast, New Zealand)*. 1911. News and notes. June 10. p. 6.

• ***Summary:*** "A German patent has been secured for the manufacture from the Soya bean of a product to take the place of rubber. The process consists in the reduction of the Soya bean to a thick, tough liquid through the addition of nitric acid. After further treatment with Alkaloid solutions, the mixture is heated to 150 deg., giving a tough, highly-elastic product similar to rubber, which can be vulcanised by the same process as rubber."

240. *New Zealand J. of Agriculture.* 1911. The soya bean. 2(6):367. June 15.
• ***Summary:*** "Among the exhibits from the Tauranga Experimental Farm was an instructive exhibit in connection with the Soya bean, which is coming into such prominence in the Old World by reason of its exceptional value as a fodder for stock. A growing plant was shown as well as the beans. Nine varieties are being received from the United States Department of Agriculture. These will be tested at Tauranga."

Note: This is the earliest document seen (July 2008) concerning the cultivation of soybeans in New Zealand.

241. *Queensland Agricultural Journal.* 1911. Soya beans. 26(6):323. June. Summarized from the Australasian. [1 ref]
• ***Summary:*** "Experimental plots of Soya beans were sown last season in various parts of Victoria (says the "Australasian") under the direction of J.M.B. Connor, Agricultural Superintendent." Many of the crops were satisfactory. The seed from which the crops were grown was imported last year by the Department of Agriculture. The varieties were Guelip [Guelph?] and Itosan [Ito San] (oil producers), and Baird and Brownie (forage kinds). Fair supplies of seed are expected for next season from the special plots devoted to these varieties. Address: Australia.

242. *Mercury (The) (Hobart, Tasmania, Australia).* 1911. Work and production: The cow pea. July 4. p. 7.
• ***Summary:*** "An experiment in which the much vaunted soya bean came into comparison with the cow pea has taken place at the Hawkesbury Agricultural College... In preparation for the coming replanting, this land, which is only poor sandy soil, was deep stirred twenty inches, and, as a means of restoring fertility to the ground, a crop of cow peas and soya beans was planted in the first week in November last, to be ploughed in green. A third each of the area was put in black cow pea, soya beans, and Poonah cow pea. The soya bean has been more or less a failure, and contrasts markedly with the luxuriant growth of cow pea on either side. The seed germinated indifferently and the [soya bean] plants themselves have made much less growth than the cow pea. The crop of the latter is fully ten times heavier."

243. Newport, H.; Wood, C.E. 1911. Tropical industries: The soy or soja bean. *Queensland Agricultural Journal* 27(1):21-27. July. [6 ref]
• ***Summary:*** The "first introduction [of the soybean] into the Queensland tropics, if not into the State, was in 1900, in November of which year a consignment was received at the Kamerunga State Nursery, Cairns, from the head offices of the Department of Agriculture in Brisbane. In September, 1901, also, the records show some Soy bean seed to have been included in a parcel of seed received from the Biggenden State Farm, indicating that a supply had also been sent to that Institution in 1900, and possibly, therefore, to other State farms and agricultural institutions. At neither place do the results of this seed seem to have elicited any special report or attracted attention. For a season or two subsequently seed was available here but seldom applied for, and results did not warrant its advocation as a farm crop." Thereafter until 1911 many variety trials were conducted, but with only modestly encouraging results in North Queensland.

One section summarizes the results of soybean experiments in other countries, and another gives details on soybean cultivation in Queensland in 1910 using seed imported by the overseer, C.E. Wood and tested in May, June and October 1910, and Jan. and Feb. 1911: Yellow varieties from Manchuria, Shanghai, Japan, Tolga, Sydney, and Brisbane; red varieties from Shanghai and Manchuria, black variety from Shanghai. A photo shows "A row of soy beans in the nursery, Kamerunga."

Pages 25-27 give details on cultivation of soy beans in Queensland: Climatic conditions, vitality of the seed, germination, method of sowing, growth and size of plants, ripening, returns, pests &c. ["the leaves were readily eaten by grasshoppers, caterpillars, slugs, &c." The leaves are also finely perforated by an unknown insect], style of growth, root system, nitrogenous nodules, other varieties, and finally [conclusion]. "While the experiments at the Kamerunga State Nursery have in some points differed from and in others agreed with experiments in other places and countries, even allowing for the season, as yet the Soy bean has not shown itself capable of sustaining the valuable attributes ascribed to it in comparison with other legumes under the climatic and soil conditions obtaining in North Queensland. The experiments are, of course, being continued."

Concerning germination: "The North Queensland germinations averaged four days, seldom less and sometimes up to nine or ten days. Soaking or similar treatment of the seed expedited germination, but involved a greater risk should hot dry weather immediately follow the sowing in the field. In sowing, well worked soil was shown to be essential. Deep planting is detrimental, and occasionally prevented germination. The best depth was found to be in 1 in. or less in moist weather; in dry weather slightly deeper. The soil must be prevented from caking once the plumule showed above ground, otherwise the seedlings pinch off easily."

Note: This is the earliest English-language document seen (Aug. 2008) the uses the word "plumule" in connection with the soy bean. Coined in 1727, "plumule" is a botanical term referring to the part of a plant embryo that develops into the shoot system, consisting of the epicotyl and first leaves. Source: Oxford English Dictionary. Address: 1. Manager; 2. Overseer. Both: The Kamerunga State Nursery, Cairns, northern Queensland.

244. *Advertiser (The) (Adelaide, South Australia).* 1911. The land and the producer: The soya bean. Aug. 19. p. 14.
• ***Summary:*** "The Soya bean has received a good advertisement in some agricultural journals, but that the wonderful virtues and results claimed from it should be regarded with caution is made evident by experiments conducted in Queensland. The State "Agricultural Journal," in detailing the results of experiments made at the Kamerunga nursery, near Cairns, says:"

There follows a summary of Newport, H.; Wood, C.E. 1911. "Tropical industries: The soy or soja bean." *Queensland Agricultural Journal* 27(1):21-27. July.

The summary emphasizes that "in no case were the results very encouraging. The crops from the May sowings were very poor."

245. *Grey River Argus (West Coast, New Zealand).* 1911. A food in diabetes. Aug. 24. p. 8.
• ***Summary:*** "Drs. Friedenwald and Ruhrah have (says 'Science Siftings') been treating a large number of diabetes cases with soy bean." Summarizes their findings.

246. Deschamp, Victor. 1911. The soy bean. *J. of Agriculture, Victoria (Australia)* 9(9):621-29. Sept. 11. Reprinted in the Tropical Agriculturist (Ceylon) 37(5):410-15. 15 Nov. 1911.
• ***Summary:*** This comprehensive review of world literature on the Soy Bean discusses: Economic uses. Cultivation. Harvesting seed. Experiments in Victoria. Probable causes of failure: Bad germination, variety, alkalinity of the soil, depth of sowing the seed, other causes of failure (rabbits, slugs, cut worms).

"Despite the favourable reports published in numerous scientific and trade publications throughout the world, the cultivation of the Soy Bean has not yet been seriously undertaken in Victoria."

Harvesting seed: "As a general rule, the soy bean, when wanted for seed, should be cut when the majority of the pods are getting brown in color and about half of the leaves have fallen. Some varieties shed their seed very easily when about ripe, and it is advisable to cut and rake at a time of day when the pods are slightly moist with dew. Rake immediately into small stooks [British word for shocks].

"In America, portable frames are used and the cut plants heaped in them, thus insuring a good circulation of air to produce good curing. If the crop is cut and bound, the sheaves are apt to become mouldy. When dry, the seed can be readily separated by means of an ordinary threshing machine.

"Soy beans for seed must be kept in thin layers in cool, well ventilated bins. When buying seed, empty the bags as soon as received, and keep the beans spread out in a cool dry place. The best of seed, if kept in bags till sowing time, may heat sufficiently to destroy its growing powers."

In 1909 a quantity of seed was imported from America. The variety was not known. Plants from this seed grew very well in some districts. A consignment was received by the Department of Agriculture from Shanghai in September 1910 through Mr. J.M. Sinclair, Commercial Agent for Victoria in the East. Selected seeds were grown separately at Cheltenham. They were sown on Oct. 10, and cut for green fodder on Feb. 27. The yields obtained per acre were: Ito San (yellow)–12 tons 8 cwts; Baird (brown)–13 tons 10 cwts. No mention is made of seed yields. Note: 1 cwt = hundredweight = 112 pounds.

"Experiments were also conducted at Ballarat, Bellarine, Heidelberg, Lilydale and other centres throughout the state [of Victoria]. Although a moderate amount of success was achieved further experiment will be necessary. With that object in view the Department of Agriculture has recently imported a large quantity of seed for distribution."

Photos show: (1) Osier bins at Dairen, Manchuria, used for storing [soy] beans (p. 622). (2) Piles of beans in sacks at Dairen wharves (p. 622). (3) Piles of beans in sacks and round bean cake awaiting shipment (p. 622). (4) Soy bean plant with roots (p. 626). (5) Field of soy beans at Cheltenham (p. 628). Address: Analyst, Agricultural Lab., Victoria, Australia.

247. Clifton, E. 1911. The soya bean. *New Zealand J. of Agriculture* 3(3):219. Sept. 15.
• ***Summary:*** "The Department [of Agriculture] secured a small quantity of seed of this plant. It was received somewhat late in the season, but the experience gained encourages further trials. For that purpose a supply has been obtained for the coming season. Small quantities can be furnished to a limited number of applicants for experimental plots. The cultivation should be similar to that extended to French beans...

At Tauranga seed sown on the 17th December [1910] was harvested in May [1911]. The general yield of beans was estimated at 960 lb/acre, however rich land gave a yield of 1,450 lb. per acre. On a part where the land was rich the yield was estimated to be 1,450 lb. per acre. There is every expectation that the crop would have been far heavier if the seed had been available for sowing in October.

248. Reynolds, Mark H. 1911. Summer crops for grain and silage, Western District. *Agricultural Gazette of New South Wales* 22(9):762-69. Sept.
• ***Summary:*** The fodder crops tested were maize, sorghums, cowpeas and soy beans. The section titled "Cowpeas and soy beans" (p. 763) notes that soy beans were planted this

season. The variety planted was not suitable in any instance. The seed germinated well; the first month it exceeded the cowpeas in growth. "During the second month the soy beans were affected by bean-rust and devoured by leaf-rolling insects. The grasshoppers also preferred them to the other crops, and completed their destruction." Address: Inspector of Agriculture.

249. *Queensland Agricultural Journal.* 1911. Soya beans. 27(4):187. Oct. [1 ref]
• ***Summary:*** From Tropical Life: "Last year Corea [Korea] exported £584,500 of Soya beans, mostly to Japan. The Corean bean is said to be superior to its Manchurian rival, and so large an increase in its export (£200,000, or more than 30 per cent. over 1909) has released that quantity of Manchurian beans, required for the Japanese manufacturers of soya, &c., and enabled them to be sent to Europe, where the demand is rapidly increasing." Address: Australia.

250. *Chemist and Druggist (London).* 1911. New Zealand is the latest country... 79(19):691. Nov. 4. *
• ***Summary:*** "... to experiment with the cultivation of soya beans, the Department of Agriculture having taken up the matter."

251. Deschamp, Victor. 1911. The soy bean. *Tropical Agriculturist (Ceylon)* 37(5):410-15. Nov. 15. [1 ref]
• ***Summary:*** Reprinted from the *Journal of Agriculture, Victoria* (Australia), Sept. 1911, p. 621-29. Address: Analyst, Agricultural Lab., Australia.

252. *Poverty Bay Herald (Gisborne, New Zealand).* 1911. Canterbury Frozen Meat Company. Nov. 22. p. 3.
• ***Summary:*** "With the object of obtaining an even higher standard for prime Canterbury mutton than it now boasts, the Canterbury Frozen Meat Company has given over four acres of land between its works at Belfast and the railway line for field experiments in the raising of roots and fodder for stock. The experiments will be carried out by the company in co-operation with the Agricultural Department, the company finding the, land and the fertiliser and the Department the seeds, besides supervising the work of planting and harvesting.

"The endeavor is to show farmers of the district what roots and fodder are most suitable, and with that end in view plants are being experimented with that they have not grown previously in Canterbury. The varieties of plants are as follows: Maize, three; millet, four; Soya beans, one; cow peas, two; Chou Moellier, one;... The results will be published by the Agricultural Department as soon as they are available."

253. *J. of the New Zealand Department of Agriculture.* 1911. The soya bean. Its possibilities in commerce. 3(6):487-88. Dec. 15. [1 ref]
• ***Summary:*** "In a recent communication to the Department, the High Commissioner in London conveys much interesting information of the soya-bean industry. This bean, which is taking a commanding position in the Old World [Europe] as a food for stock, has not yet been tested on a commercial scale in this part of the world; but added interest is being attached to it with the growing appreciation of the need of better feeding of our live-stock. The department is testing a number of varieties of soya bean received from the United States Department of Agriculture at the Tauranga Experimental Farm..."

The report notes that from Dalny (in Manchuria) and Vladivostok (in Russia) large quantities of soya beans are shipped to the United Kingdom. Small consignments of the bean and oil are received from Japan. "'These beans contain from 17 to 18 per cent. of oil, which is pressed out by ordinary crushers or extracted by the solvent extraction process. Originally the oil was used for soap-making but now it is used not only for this purpose, but much more largely for replacing linseed-oil. It is also used for lubricating, burning, and for edible The residue, after the oil has been extracted, is now well recognized as being one of the best foodstuffs for cattle. It is exceedingly rich in albuminoids in a readily digestible form. The opinion is expressed that in time this residue will come to be used as human food. Note: This is the earliest English-language document seen (March 2003) that uses the term "solvent extraction" in connection with the commercial crushing of soybeans to give oil and meal.

"'The greater quantity of the soya-bean supply is shipped direct to this country, is crushed either in Hull or Liverpool, and large quantities of the oil are shipped to the [European] Continent. I am informed that bean-oil, without the aid of driers of some kind, will not dry hard...

"'Experiments have been made in many countries to grow soya beans and apparently some of these experiments have been perfectly successful, as the Hull Oil-manufacturing Company have received samples grown within 200 miles of Calcutta, and the bean is now offered in small quantities from South Russia. Experiments are being made in Rhodesia, Canada, South America, and other places within the wheat and cotton belts.'" Address: New Zealand.

254. *Advertiser (The) (Adelaide, South Australia).* 1911. The land and the producer: The autumn show. Dec. 23. p. 15.
• ***Summary:*** "The prize list for the Royal Agricultural Society's annual autumn show to be held at the Jubilee Exhibition Grounds on March 7, 8, and 9 or next year, is now available."

"Special prize of £1 is offered by Messrs. E. and W. Hackett for ½ cwt. green fodder plant, either "Green Tessinate" [Teosinte] or Green Soja Beans. The society this year will pay the actual carriage or freight to show grounds on all exhibits of cereals entered for competition and it is hoped that this will induce farmers to make a large number of entries."

255. Clarke, William Horace, comp. 1911. The farmers' handbook. 1st ed. Sydney, NSW, Australia: New South Wales Dept. of Agriculture. vi + 748 p. See p. 426-27. Illust. Index. 25 cm. 2nd ed. was 1916.
• ***Summary:*** Compiled principally from articles which appeared in the Agricultural Gazette of New South Wales (see Preface).

Section 8, "Leguminous crops (p. 411-49), has the following contents: Introduction. Lucerne [alfalfa]. The cowpea. Lima-bean. Soy-bean. The kidney or French bean *(Phaseolus vulgaris,* Linn.). Horse gram. Mung-bean *(Phaseolus mungo).* Square-podded pea *(Lotus tetragonolobus).* Dolichos sp. Chicken-pea or gram *(Cicer arietinum* [Chickpea or garbanzo bean]). Pigeon-pea *(Cajanus indicus).* Villous vetch *(Vicia villosa).* Algerian vetch. Lupins. Field peas and vetches. Diseases of the bean plant: Bean anthracnose, bean rust *(Uromyces phaseoli),* French bean fly. Clovers and tares (or vetches).

"Soy-bean. *(Soja hispida,* Moench.). Seeds of three varieties are to be recommended, viz., Common White, long grown here; Improved White, from the United States; and a black variety from Queensland. Sow in drills 2 feet apart, and thin out the plants to 1 foot apart in the drill. At first the plants grow rather slowly, but as the weather becomes warmer the growth is more rapid. In a trial at Wagga, when about 15 inches high, the plants of Common White and Black were badly attacked by bean-rust; but, strange to say, the plants of Improved White, which were growing next to these varieties, were not affected in the slightest degree. The Improved White variety appeared to be well suited for this climate, as the plants grew very rapidly; in fact, it appeared as if they were making too much leaf, and that the yield of pulse would, therefore, suffer, but from the results obtained it would seem that this could not have been the case. So badly affected were the other two varieties it was feared that they would not seed; but heavy rains, soon after they commenced flowering, somewhat revived the plants, and a fair return of pulse was obtained, though the yield must have been much impaired by the disease.

"When fully grown the plants of the Improved Variety were from 3 feet to 3 feet 6 inches in height, and nearly 2 feet through 9 inches from the top of the plant. The stalks are strong and woody, and they have numerous branches covering the heavy foliage. The stalks and branches are thickly studded with clusters of hairy pods. In order that a fair idea of the productiveness of these plants might be obtained, the number of pods and number of beans on each of the first six plants in the drill were counted, with the following result." A table shows the number of pods per plant ranged from 182 to 284 (average 236). The number of seeds per plant ranged from 443 to 781 (avg. 648). The average number of beans per pod is 2.7. "Most of the pods had three beans in them. One branch on plant 4 had no less than 114 pods on it. A portion of the plants were fed to cattle just as they came into flower, and were preferred before any other pulse grown that season.

"The remainder were pulled as soon as the pods were ripe, and were laid out in the sun to dry; the pulse were then threshed out and the dry haulms were fed to cattle, who appeared to be very fond of them. The results obtained will be found in the following table." The table has four columns: Name of variety. Seed obtained from -. No of days in which the crop occupied the land. Yield of dry pulse per acre in bushels of 60 lb.

Improved White, from United States, 148 days, 47 bu. Common White, from Sydney, 135 days, 13*. Black, from Queensland, 127, 9*. (Footnote: *Badly affected with bean-rust).

"The only fault that could be found with the Soy-bean was that it was too slow in ripening its seed, it being nearly five months in coming to maturity, but as the plants grew best during the month of January, especially during one hot dry week, it is clear that this plant is best suited to the warmer parts of the State. Farmers are strongly recommended to plant a small area with this crop, as the beans, shelled out when quite green, form a delicious vegetable, and the plants after the pods are taken off make very good feed for cattle.

"The Department obtained a small quantity of seed of the Common White variety and distributed it to a number of farmers in different parts of the State. The seed germinated badly, but most of the plants that were obtained grew remarkably well." Brief reports from Bathurst, Rylstone, and Moama are given. Two of these reports stated that the beans were "delicious" to eat. Address: New South Wales Dep. of Agriculture, Sydney, Australia.

256. Hooper, David. 1911. Soy bean in India: Glycine hispida. *Agricultural Ledger (Calcutta)* No. 3. p. 17-33. (Vegetable Product Series No. 114). Also reprinted in Tropical Agriculturalist, 1912. 38:11-15, 99-103.
• ***Summary:*** Contents: Introduction. Experimental cultivation in India. Vernacular names of the soybean. Method of cultivation: Green manure, harvesting. Races and varieties. Races in India: Yellow [grown in Poona Experimental Farm, Burma, Darjeeling, Dehra Dun, Simla, Punjab], green [Poona], black [Poona, Kashmir to Darjeeling, Simla], brown [Kashmir, Kalimpong to Darjeeling], mottled [Shillong, Assam]. Composition of the seed: From Church, from König, from Dr. J.W. Leather (1903), tables showing analyses made in India of Indian-grown Soy beans from various provinces (Burma, Hill Tracts, United Provinces [black seeds], and Poona). Soy bean oil. Soy bean oil-cake. Composition of hay. Use as

food: Soy-bean milk, bean cheese (topo, sic tofu, or "Soy-bean cheese"), shoyu ("Under the name of 'Soy sauce' and other fanciful names it has formed the basis of most of the important sauces of Europe for many years."), roasted soy beans as a coffee substitute, soy beans in diabetic diets. Trade (exports of Soy bean from Manchuria to England). Price.

"The plant was introduced into the United States of America in 1854 and was grown to a small extent in the Southern States, but from the year 1885 its cultivation as a forage crop has gained in importance in all the agricultural centres. Within the last two or three years a great deal of interest has been taken in the cultivation of Soy, and experiments are in progress in Government Farms in Cape Colony, Natal [South Africa], East Africa, Gambia, Mauritius and Australia.

Contains a good early history of the soybean in India: "It is difficult to ascertain the date of the introduction of Soy beans into India. There is no doubt that certain hill tribes, mostly of Mongolian origin, have cultivated the bean for a long time. At the Punjab Exhibition held at Lahore [later divided between India and Pakistan] in 1864 Soy beans identified by Dr. Cleghorn, were sent from the Hill States. This is the first record of the beans being exhibited in this country, and shows that the cultivation was on a insignificant scale.

"Experiments in India. In 1882 Messrs. Jardine, Matheson & Co. of Hong-Kong sent a sample of Soy beans for experimental cultivation in the Saidapet Experimental Farm, Madras. The plants raised from these seeds were healthy but the yield of the crop was small.

"In 1897 Surgeon-Colonel W.G. King, Sanitary Commissioner, Madras, strongly advocated the cultivation of Soy bean as a valuable food worthy of the attention of the people. In two experiments carried on at Saidapet during 1897-98, the yield of seed per acre was 468 to 495 lbs., respectively. Recent enquiries in Madras resulted in the opinion that the cultivation in the Presidency is still in an experimental stage.

"In 1882 some Japanese Soy beans were sent by the Government of India for trial to Saharanpur. In 1885 very good results were obtained, the black seeded variety giving a yield of 1,124 lbs. per acre, and the white seeded variety giving a yield of 561 lbs. per acre. In 1886 the acclimatised seed was widely distributed; in some cases the crop failed and in others it was fairly successful, but as a rule where seed was harvested it was said that the pulse was not popular in any form. The Botanical Gardens grew the crop for a few years longer but as there was no demand for the seeds the cultivation was abandoned. An interest in Soy bean, however, seems to have revived for the Agricultural Department has this year sent to the Reporter on Economic Products samples of the black variety of Soy beans from forty villages of the United Provinces.

"At the Experimental Farm at Nagpur, Central Provinces, the bean was grown experimentally from Japanese seed first planted in 1885. The yield at the end of the first year was at the rate of 180 lbs. per acre, but taking the average of five years the result was 88 lbs. per acre. In the Report for 1908-09 it is stated that Soy beans were grown on a small area under field conditions and the yield was fair, but there was little local demand for the seed. It was, however, ground and formed an excellent addition to the diet of the farm cattle. Last year only 43 lbs. were obtained on light soil on the Nagpur Farm, the crop being practically a complete failure; on heavier soil 380 lbs. of seed were raised.

"Soy beans have been grown at Poona for nine or ten years with varying results, and they have also been tried at Nadiad in Gujrat [Gujarat] and elsewhere in the Bombay Presidency. In the Experimental Farm Report for 1901 a large yield was chronicled, but next year the crops at Poona and Surat failed. In 1904 a yield of 300 lbs. per acre was obtained in light land. One year later nineteen plots were under trial but with unpromising results, for only five yielded seed enough to repay the cost of cultivation. The yield varied from 50 to 293 lbs. per acre, and it was found that only when the yield exceeded 200 lbs. was the crop profitable. In 1905-06 the Manjri Farm, Poona, grew nineteen plots with better results, probably due to better soil. The yield of some of the plots was on an average of 680 lbs. per acre–a highly remunerative return. A year later it was reported by Mr. Fletcher, Deputy Director of Agriculture, that an experiment made on the edge of black cotton soil gave a yield of 1,166 lbs. per acre, while adjacent plots gave from 395 to 650 lbs. per acre.

"In the Agri.-Horticultural Gardens at Lahore Soy bean planted on a small area in 1894 yielded an estimated crop of 349 lbs. of seed per acre and 349 lbs. of fodder. Evidently it varies greatly in suitability to different soils and climates and does not seem to be adapted to the sea level plains of India.

"Gollan observed that the Japanese plant is erect, attaining a height of 12 to 15 inches, while the Himalayan form is a trailing plant. So far this vigorous growing plant does not appear in India to have been attacked by any insect or parasitic fungus.

"With regard to Burma, Mr. Burkill remarks: 'The Burmese grow it under the names of Pe-nga-pi and Pe-kyat-pyin, sowing it never in great quantities along with other beans on the mud banks as the falling rivers leave them bare in October, or more sparingly still away from the rivers. The Kachins and other hill tribes grow a little of it on their hill clearings, the Kachins call it Lasi. The Khasis, the Nagas and other tribes between the Brahmaputra and Upper Assam cultivate it similarly... In the Brahmaputra Valley it is grown as far as known only towards Barpeta in the Kamrup District.'

"Soy beans are called 'Bhut' in the Punjab, 'Bhat', 'Bhatwas' or 'Bhatmas' in the United Provinces and in the hills as far as Darjeeling, and 'Rymbai ktung' in Shillong and the Khasi Hills. Mr. B.C. Basu gives the Assamese name for *Glycine* as 'Patani jokra' and the corresponding Bengali name as 'Chhai.' In the Naga Hills it is called 'Tsudza' or 'Sudza.' It is grown by the Lepchas in Sikkim and is called by them 'Salyang' or 'Silliangdun.' 'Pe-nga-pi' is the usual name for Soy bean in Burma, but it has been received under the name of 'Lasi shapre tum' from Bhamo, and as 'Lasi N'Loi' and 'Lasi N'Hti' from Myitkyina. The Santali name appears to be 'Disom Horee.'"

"Dr. J.W. Leather in 1903 analysed the seeds of seven samples of Soy bean from Japanese seeds cultivated at Manjri, near Poona. The amount of oil in them varied from 14.92 to 23.05 per cent. being on the dry weight 15.97 to 24.41 per cent. with an average of 19.99. In 1902 Dr. Leather examined five samples grown on the Dumraon Farm. They yielded from 14.27 to 19.72 per cent of oil on the air-dried seeds.

"Fourteen samples of the seeds grown from Japanese seeds at the Manjri Experimental Farm were again analysed last year by a leading European firm. The percentage of moisture varied from 9.90 to 12.06, and the percentage of oil from 16.80 to 22.48...

"The following analyses of Indian-grown Soy beans were made in the laboratory of the Indian Museum in 1909 and 1910." Gives names and composition (oil [as is and on a dry basis], water, and ash) for 17 varieties from Burma, 21 from the Hill Tracts, 11 from the United Provinces [black seeds], and 15 varieties from Poona. "An attempt in 1903 to extract oil from these beans with the country *ghani* or indigenous oil-mill was a failure in Bombay."

Note: This is the earliest English-language document seen (Feb. 2004) that uses the term "soy-bean cheese" to refer to tofu.

257. Baylis, G. de S. 1912. Marton Experimental Plots. Brief summary of work undertaken. *J. of the New Zealand Department of Agriculture* 4(1):10-16. Jan. 15.
• ***Summary:*** The plots are used mainly to test varieties of wheats, oats, and barleys recently introduced from Europe. Maizes, millet and sorghum are also being tested for the making of stack ensilage. "Other new forage plants such as Helianti, are being tested, as well as Soya beans, Velvet beans, Buda kale, American kale, and suchlike, and the work is being carried out under ordinary farming conditions and with usual implements."

258. Hooper, David. 1912. Soy bean in India: Glycine hispida. *Tropical Agriculturist (Ceylon)* 38(1):11-15. Jan. 15; 38(2):99-103. Feb. 15. [1 ref]
• ***Summary:*** This is a reprint of an article by the same author with the same title published in 1911 in *Agricultural Ledger* (Calcutta) No. 3. p. 17-33. Address: Australia.

259. *Queensland Agricultural Journal.* 1912. The soja bean in New Zealand (Abstract). 28(1):6. Jan. [1 ref]
• ***Summary:*** An English-language summary of the following English-language document: Clifton, E. 1911. "The soya bean." *New Zealand J. of Agriculture* 3(3):219. Sept. 15. Address: Australia.

260. *Queensland Agricultural Journal.* 1912. The soja bean as a source of rubber. 28(1):66. Jan. [1 ref]
• ***Summary:*** From India Rubber World: "The high price of rubber during the year 1910 has had,... a stimulative effect,... on the activity of those inventors who devote their attention to the production of synthetic rubber, rubber substitutes, and the perfection of the various processes for the reclamation or other means of using old rubber." A German patent has "been issued for the manufacture of artificial rubber from soja bean oil." Address: Australia.

261. *J. of Agriculture of South Australia.* 1912. The soya bean: Increasing popularity. 15:757-58. Feb.
• ***Summary:*** Contents: The trade in beans. Use as a stock food. As a restorative crop. Trials in Australia.

During the past few years there has been an extraordinary increase in the soya bean trade. "In England the value of the bean has become so well recognised that the London *Times* states that this year's requirements of the bean (for oil extraction and the residual cake for cattle food) would be over one million tons.

"The soya bean has been hailed as one of Australia's coming crops. From experiments made there 'wonderful results in Queensland,' and 'encouraging tests in Victoria' are reported." At "Cheltenham upwards of 13½ tons of green soy fodder per acre was obtained, and 10 tons per acre at Ballarat." Varieties planted at Cheltenham were Ito San (yellow), Baird (brown), Brownie (brown), and Guelph (green). The yield from each variety in tons of green soy fodder per acre is given. Baird was the leader with 13 tons, 10 cwt and 10 lbs. Note: 1 cwt = hundredweight = 112 pounds.

Note: This is the earliest document seen (Oct. 2007) concerning the cultivation of soya beans in South Australia.

262. *Advertiser (The) (Adelaide, South Australia).* 1912. Inter-state markets. April 4. p. 14.
• ***Summary:*** "Sydney, April 3... Four tons of Champion's white lead sold at £39 10/ and £40. Fifty cases of Soya bean oil sold at 6/6."

263. *Evening Post (Wellington, New Zealand).* 1912. Sanitarium health food cafe. May 10. p. 8.
• ***Summary:*** "About six or seven years ago a cafe was opened in Willis-street by the Sanitarium Health Food

Company. Later it was shifted to Manners-street, and owing to a fire the cafe is again located in Willis-street, in Shortt's Building. The change made is certainly a very advantageous one–a new building with a bright, cheery outlook, instead of one of the oldest places in Wellington. There are twelve tables in the room with ample seating accommodation for fifty people.

"The cafe is owned by the Sanitarium Health Food Company, whose headquarters are in Sydney [Australia], with a manufactory at Cooranbong, 80 miles from the city, and another manufactory in Christchurch [New Zealand]. The latter is likely to be shifted to Wellington, and placed under the manager of the cafe here. As considerable misunderstanding exists as to what constitutes a cereal-vegetable [vegetarian] diet, it may be stated that there are half-a-dozen classes of biscuits, a dozen kinds of green goods, six varieties of beans and two of lentils, and, generally, all vegetables and fruits in season.

"Olive-oil is imported from Italy, best selected raisins from California, unfermented wine from California and New South Wales, and clover honey is obtained from local apiaries. Amongst the many special foods for invalids are gluten flour and biscuits, and Soya beans for diabetic patients: it is stated that this bean is rich in gluten. Whilst the principal aim of the Sanitarium Health Food Cafe is to cater for those in health, it is claimed that indigestion and many forms of stomach trouble can be eradicated by the adoption of the food served up at the cafe, or by buying the ingredients and cooking them at home. The object is to endeavour to educate the public to live on what is regarded as a higher quality of food for mental or physical work."

264. *Board of Trade Journal (London).* 1912. Australia: Denaturation of soya bean oil. 77:515. June 6. [1 ref]
• ***Summary:*** A by-law of the Australian Commonwealth (no. 216) dated April 23, 1912, prescribes additional methods to those referred to in by-law no. 195 of denaturing soy bean oil, in order that it may be imported free of duty under Item 234 (H) of the tariff. Under this by-law, soy bean oil may be denatured as follows: 1. By adding 25 gallons of commercial neatsfoot oil and 25 gallons of 300°C test kerosene to 50 gallons of soy bean oil. 2. By adding 5 gallons of terebene (a mixture of terpenes from oil of turpentine) and 5 gallons of turpentine to 90 gallons of soy bean oil. 3. By adding 25 gallons of tung oil to 100 gallons of soy bean oil.

265. McConnell, Primrose. 1912. Ruakura Farm of Instruction: The forage crop of 1911-12. *New Zealand J. of Agriculture* 4:449-53. June 15.
• ***Summary:*** "Soya beans and cow-peas have been a comparative failure; and, although it is yet too soon to form a definite opinion, I do not think that in an average season the New Zealand climate will be found suitable for the growing of these crops profitably. The failure is due more to unsuitable climatic conditions, intensified by an abnormal season, rather than to unsuitable soil-environment... In the case of the Soya bean, where the seed can be properly ripened the crop is of greater commercial value; but the climate of New Zealand, generally speaking, is, I think, too uncertain to warrant the cultivation of this plant on a large scale, although a variety may yet be found that will suit the climate. It is interesting to note that in a row of Soya beans growing in the nursery from seed grown last season on the farm, although the plants are strong and healthy, not a single bean-pod has been produced." Soya beans sown on November 2, 1 bushel per acre, reached maturity on April 1, at a height of 2 feet. Address: New Zealand.

266. *Poverty Bay Herald (Gisborne, New Zealand).* 1912. A leguminous product new to this Dominion is the "Soya Bean,"... June 18. p. 4.
• ***Summary:*** "... samples of which are being shown by the Ruakura Farm of Instruction at the Waikato winter exhibition (says the *Auckland Star).* It is a large dark bean of prolific growth, containing oil properties which are said to equal those of linseed. After this has been extracted for manufacturing purposes the residue is usually made into oilcake for cattle fodder purposes. If preferred the crop can be cut as green feed or made into ensilage. Being a leguminous growth it possesses valuable properties for the improvement of the soil."

267. *Agricultural Gazette of New South Wales.* 1912. Trials of soy beans. 23(7):592-94. July 2. Summarized by the Bulletin of the Imperial Institute. 1912. p. 668.
• ***Summary:*** "In Oct. 1911, seeds of Soy Beans received from Victoria were distributed by the Department of Agriculture to various centres in New South Wales for trial. These seeds were supplied as being of a specially suitable variety for our conditions.

"In November, small packets of soil received from China were sent to Cowra and Wagga Experiment Farms, with instructions that the soil in which the soy beans were to be grown should be inoculated with the China soil, and the results carefully noted." A summary is given of the reports received from the coastal districts (soybeans were planted at Bonville, Wollongbar Experiment Farm, Hawkesbury Agricultural College, Unanderra), tableland districts (planted at Bathurst Experiment Farm), western slopes (planted at Cowra Experiment Farm), Riverina (planted at Wagga Experiment Farm, Elm Park/Jindera, Harden, and Yanco Experiment Farm), and the western plains (at Nyngan Demonstration Farm).

In New South Wales soybeans either failed to germinate, or the young plants were killed by unfavorable weather or destroyed by rabbits. In spite of the fact that the experiments were made on a small scale and that insufficient care seems to have been taken, it is concluded that black cowpeas give a larger crop for fodder and thrive better. Address: Australia.

268. *Agricultural Gazette of New South Wales.* 1912. Trials of soy beans. 23(7):592-94. July.
• ***Summary:*** "In October, 1911, seeds of Soy Beans received from Victoria were distributed by the Department of Agriculture to various centres in New South Wales for trial. These seeds were supplied as being of a specially suitable variety for our conditions.

"In November, small packets of soil received from China were sent to Cowra and Wagga Experiment Farms, with instructions that the soil in which the Soy Beans were to be grown should be inoculated with the China soil, and results carefully noted."

A summary is given of reports received from the "Coastal Districts" (Bonville, Wollongbar, Hawkesbury, Unaderra), "Tableland Districts" (Bathurst), "Western Slopes" (Tamworth, Cowra), "Riverina" (Wagga, Jindera, Hardeen, Yanco), and "Western Plains" (Nyngan).

269. Heron, A.H. 1912. The soya bean and its uses (From Cope's planting leaflets). *Queensland Agricultural Journal* 29(1):88-95. July. [1 ref]
• ***Summary:*** A near reprint of: Heron, E.H. 1911. "O feijao soya e os sues usos [The soybean and its uses]." *Reparticao de Agricultura Mozambique, Boletim* (Mozambique Department of Agriculture, Bulletin) No. 5. 16 p.

The soja bean constitutes a good food for swine. Address: Australia.

270. *J. of the New Zealand Department of Agriculture.* 1912. Field-crops and manures: Soya beans. 5(2):196-97. Aug. 15.
• ***Summary:*** Mr. W.J. Parsons from Wellington writes: "I have purchased a farm at Renwick in Marlborough... Have Lima or Soya beans been tried in the district under the Department's directions? If not, I would very much like to try them if your Department is conducting any experiments this year."

The Fields and Experimental Farms Division replies, "The Department has no field-plot experiments on farms in Marlborough. A series of tests was carried out on small plots at the Blenheim High School.

"Last season the Department distributed seed of the Soya bean for testing purposes, and proposes to do so again this year. Lima beans are already well known in the garden."

The Agricultural Chemist replies, "Beans take more potash from the soil than peas."

271. *Evening Post (Wellington, New Zealand).* 1912. The markets. Aug. 17. p. 2.
• ***Summary:*** The section titled "Produce" gives the price of cereal grains, beans, and their by-products in New Zealand. These include: "linseed oil cake, genuine, £13 10*s* per ton; "soya bean cake, £13 10*s* [per ton];..."

Note 1. This is the earliest document seen (Nov. 2009) that gives the price of soybean products (or soybeans) in New Zealand.

Note 2. Similar prices appear at least once a week in the "Produce" section this newspaper for the rest of the year. By Oct. 25 the price for soya bean cake has dropped to £12 10*s* per ton.

272. *J. of the New Zealand Department of Agriculture.* 1912. Miscellaneous trials: Soya beans. 5:287. Sept. 16.
• ***Summary:*** "Soya beans were sown on December 16 by W. Pye, Redvale, Auckland, with 3 cwt. [1 cwt = hundredweight = 112 pounds] slag, 1 cwt. super., ½ cwt. wood ashes to the acre, the soil being portion of a drained flat on the gum lands. The beans did fairly well considering the unfavourable summer experienced, and podded and ripened seed satisfactorily. Soya beans were also successfully grown at the Avondale Asylum, Auckland. Mr. Muir planted 1/8 acre on December 10, using 1 cwt. super. The beans grew about 18 inches high, averaging 98 to 100 pods on each stem. Soya beans were also grown by Mr. B. Chambers, Havelock North, and Mr. F. McRae, Palmerston North, but small success was obtained by them." Address: Redvale, Auckland; Avondale Asylum, Auckland; Havolock North; Palmerston North.

273. Kuijper, J. 1912. Soja [Soya]. *Departement van den Landbouw, Suriname, Bulletin* No. 29. p. 24-29. Nov. [Dut]
• ***Summary:*** In recent years, since 1908, soya has become a product of great importance on the world market. There are few products whose exports have risen so dramatically is just a few years. The reason for the great expansion of trade in soya can be found in the great demand by industry for oilseeds. For more than 30 years, experiments have been conducted on growing soybeans in Europe, but the results have not been very promising. Some people have suggested that soya might be able to be grown in Suriname. It is grown in many tropical countries, including Siam, British India, and Java. Requirements for cultivation and yields are discussed. Japan reports the highest yields, 2,500 kg/ha, compared with 1,000 to 1,400 kg/ha from the USA. Soybeans produce more protein and oil per unit area of land than any other farm crop. The seed is used mainly for human consumption but the plant also yields, fresh or dried, and excellent livestock feed, which is why so much research on it is now being conducted in Australia and America. It is important for Suriname that soya can be used as a green fodder, for example interplanted and fed with corn.

From soya one can make numerous products such as soymilk *(soyamelk)*, soy cheese *(soyakaas,* whose food value is higher than that of meat), soy flour, soy bread *(soyabrood),* oil *(olie),* various sauces (soya sauce, Worcester sauce, etc.), and various substitutes for coffee and chocolate, etc. *(surrogaten voor koffie en chocolade enz.).*

In Suriname soya is cultivated on a small scale by the Javanese, for example in Lelydorp and in the settlements of Johan and Margaretha. Many experiments with Soya have already been conducted in the experimental garden *(Cultuurtuin).* Seeds imported from America did not give good results; the plants remained small, yielded few fruits, and died quickly thereafter. It is a common occurrence that plants from temperate or subtropical regions do not grow well in the warm tropics in the rainy season. Of the seeds cultivated in Suriname, two varieties give good results. Those cultivated by the Javanese give hardy plants and a lot of seed though exact yield figures are not available; the planted area is still quite small. But the yield is about 1,000 kg/ha. Apparently the necessary bacteria are present in the soil, for the roots show nodulation.

In the experimental garden two beds of soya were planted on May 24. The first seeds ripened after 3 months and within 4 months all was harvested. Thus the plants developed during the rainy season, and they probably got too much water. The results would probably be better if this season could be avoided. Soya is sold in Suriname for hfl 30 per bag, a considerably higher price than that paid in Europe. On the plantations Peperpot and Jaglust experiments with soya have also been conducted. The European seed that was used gave very limited results. The experiments will be conducted again using Suriname seeds.

With the market price at hfl 10 per bag, it seems very unlikely that the cultivation of soya in Suriname will ever be profitable, unless high yields can be obtained. As mentioned above, this seems unlikely. Small scale cultivation for sale in Suriname, however, seems advantageous at present, while in areas where cattle are raised the use of soya as a green feed to replace more expensive secondary feeds will likely give good results.

Note 1 This is the earliest document seen (May 2009) concerning soybeans in Suriname, or the cultivation of soybeans in Suriname.

Note 2. This is the earliest Dutch-language document seen (March 2001) that uses the term *surrogaten voor koffie* to refer to soy coffee.

Note 3. This is the earliest Dutch-language document seen (Oct. 2003) that uses the term *soyamelk* to refer to soymilk. Address: Surinam.

274. *Poverty Bay Herald (Gisborne, New Zealand).*1912. "Cowless" milk: Made in Germany. Dec. 7. p. 5 (Supplement).

• ***Summary:*** "London. October 18. Synthetic milk–cowless milk–has arrived. The first consignment has reached London. It looked like milk, it smelt like milk, and it tasted like milk–some milk. At the best things look black for the cow. The machine-made milk was bottled in Germany, in Frankfort–patriotic cows will doubtless regard this as adding insult to injury–and opened in an office in the Strand.

"Half a dozen eminent analysts and some Government officials were there ready to taste, in the performance of their duty, and a good many other people who were also ready, even willing, to taste out of mere curiosity."

"To all questions as to the ingredients of cowless milk the same surprising and guarded answer was returned:–Soya beans–and other things."

275. *Grey River Argus (West Coast, New Zealand).*1912. Milk made by machinery: Dairies turned into factories. Germ free and cheaper than cow's milk. Dec. 9. p. 1.

• ***Summary:*** "The familiar sign 'Milk from our own dairies' may soon be supplanted in London by the announcement 'Milk from our own factories.'

"This startling development of man's struggle to improve on nature is the result of the discoveries of Dr. Saner and Dr. Goosecll [sic, Gössel; Goessel], two German scientists, who claim to be able to make by machinery milk that is superior to that supplied by the cow.

"A demonstration of this synthetic milk was given at Dane's Inn House, London, in October, in the presence of medical men and Press representatives. Apart from a sort of clinging taste after drinking it, the synthetic draught passed the palate test. It went a little better with coffee.

"The inventors of synthetic milk have been experimenting in Germany for three years, and they claim they have now produced a perfect substitute for the natural article. Analysts in Germany have reported favourably on the new product.

It is claimed that the new milk is:–Free from bacilli; More wholesome than natural milk; Made in various grades to suit, the infant or the adult; Easily standardised; And that it is much, cheaper than the natural article.

"The raw material is said to be purely vegetable, on of the main ingredients being the Soya bean, which is grown in Japan and Corea, and much used in those countries. As to the process of manufacture. Mr. Faulding stated that various vegetables were put into a machine and subjected to great heat. In plain English the machine does the work of the cow, the raw material, in the scientific sense, being exactly the same as that which supplies the natural article. It takes about seven hours to turn out the finished milk, and it is proposed to 'brew' twice a day.

"The plant is not costly, and taking an average of the various grades of strength the inventors intend to make, the price to the public will be 3*d* per quart. Cheese [tofu] can also be made from synthetic milk, which would be sold for about 3*d* a pound.

"The substitute will not make butter, but it is possible that it may be used in the manufacture of margarine.

"Synthetic milk also gives cream, but it takes longer to make it, as the fat is more evenly distributed than in the case of natural milk.

"Other claims made for synthetic milk are that it is not touched by hand throughout the process of manufacture and that it is not exposed to the atmosphere while being made, except for the brief period required for bottling.

"This, the inventors claim, makes it absolutely free from bacilli [bacteria], and thus, it is claimed, the substitute will greatly diminish consumption [tuberculosis] and other illnesses which are due to or aggravated by, tuberculosis milk.

"It is said that the new milk will keep good twice as long as cow's milk, but as it will be offered for sale in bottles of all sizes, this is not very material.

"If the invention is favourably received it is intended to build a factory in London."

276. *Poverty Bay Herald (Gisborne, New Zealand).* 1912. An artificial milk,... Dec. 13. p. 2, col. 2.
• ***Summary:*** "... manufactured from vegetables, which is said to contain all the elements of the best cow's milk, and can be used for the same purpose, was shown to a gathering of scientists in London. Mr. A.J. Faulding, who will be responsible for the introduction of artificial (or synthetic) milk to this country, told a press representative that it was more digestible than ordinary milk, and its cream was for more nourishing. The milk could be used for all cooking purposes, and a very good cheese [tofu] could be made from it, but it would not produce butter. As the milk was germ-free, it would keep longer than cow's milk. The discovery was the work of three Germans, who spent three years in perfecting it. The soya bean in the principal source of the ingredients." Address: Prof.

277. *J. of the New Zealand Department of Agriculture.* 1913. The soya bean. 6:149. Feb. 15.
• ***Summary:*** Begins with a quote from the *Lancet* of 21 Jan. 1911, noting that the soybean is well suited for diabetic cases because of its great nutritive value and low proportion of starch. Then discusses the production of soybean in the United States. "There are over three hundred known varieties and hybrids of the Soya bean." Address: New Zealand.

278. *Northern Territory Times and Gazette (Darwin, NT, Australia).* 1913. The farm: Reclaiming lost nitrogen. The basis of good farming. April 3. p. 6.
• ***Summary:*** "(By H. Alexander Shaw, in the 'N.Z. Farmer.' *[New Zealand Farmer]*) -

"Nitrogen-fixing bacteria are very widely distributed in nature, as they are present in almost all soils containing sufficient organic matter (humus). It has been frequently demonstrated that soil inoculated with the above bacteria is capable of producing a better leguminous crop than soil untreated. Recent researches, however, tend to show that there are different varieties of the tubercle bacteria, and that to obtain the best results the farmer must innoculate his soil with the organisms which have been isolated from the same species of plant. For example, Conn states: The soil of Connecticut is not adapted to the legume called the Soya Bean."

There follows a long summary of the book: Conn, Herbert William. 1901. *Agricultural Bacteriology: A Study of the Relation of Bacteria to Agriculture, with Special Reference to the Bacteria in the Soil,...* The "Soya Bean" is mentioned eight times in the summary, which emphasizes: "In growing a Soya Bean crop, he [the farmer] must inoculate his soil with Soya Bean tubercle bacteria, and not with bacteria from another leguminous plant."

Note: This is the earliest document seen (Oct. 2009) concerning soya beans in Australia's Northern Territory.

279. *Northern Territory Times and Gazette (Darwin, NT, Australia).* 1913. The farm: The soya bean. Remarkable results recorded. April 24. p. 3.
• ***Summary:*** A good overview of world developments. Contents: Introduction. The trade in [soya] beans (worldwide). Use as a stock food. As a restorative crop. Trials in Australia (at Queensland and Victoria). Illustrations (line drawings) show: (1) A soya bean plant (above ground portion). (2) The root system of a soya bean plant, showing root nodules that fix nitrogen in the soil from the air.

The article begins: "The extraordinary increase in the Soya bean trade during the past few years is one reason why this crop should be thoroughly tested. An other reason is that the Soya bean has been proved to be a staple legume and a restorative crop for profitable growth in rotation with maize" (?).

The section titled "Trials in Australia" states: "The soya bean has been hailed as one of Australia's coming crops. From experiments made 'wonderful results in Queensland' and 'encouraging tests in Victoria' are reported. In Victoria 30 lbs. of seed to the acre was used, and at Cheltenham up wards of 13½ tons of green soy fodder per acre was obtained, and 10 tons per acre at Ballarat. Special sowings were made at Cheltenham on 10th October, and were cut for green fodder on 27th February. The following yields were obtained:" A table shows the yield per acre from four varieties.

"Ito San (yellow): 12 tons, 3 cwt, 54 lbs.
"Baird (brown): 12 tons, 10 cwt, 10 lbs.
"Brownie (brown): 11 tons, 6 cwt, 92 lbs.
"Ito San (yellow): 11 tons, 6 cwt, 96 lbs."

280. *Queensland Agricultural Journal.* 1913. Pastoral: Soja bean for fattening lambs. 30(4):223. April. [2 ref]
• ***Summary:*** "Several articles on the value of the soja bean have been published in this journal... Now we have from a bulletin of the Wisconsin Agricultural Experiment Station that the experts there have tested the value of soja-bean seed for fattening lambs. In one experiment two lots of ten lambs each were fed the same roughage. One lot received shelled corn and whole soja beans in equal proportions, while the other received the same quantities of shelled corn and whole oats. The average gain of each lamb during a period of twelve weeks was 16.3 lb. when soja beans constituted a part of the ration, and but 13.7 lb. when oats were used. A pound of gain was produced on 6.11 lb. of grain and 7.11 lb. of roughage in the soy-bean ration, while 7.28 lb. of grain and 8.62 lb. of roughage were required on the oats ration." Address: Australia.

281. *J. of the New Zealand Department of Agriculture.* 1913. Grasses and clovers: Soya beans. 7:681. Dec. 20.
• ***Summary:*** Mr. S. Eyre Baxter, Taikawhana writes, "Can you give any information about Soya beans? Will they grow here, and can the seed be obtained?"

The Fields and Experimental Farms Division replies, "Soya beans were grown in various parts of New Zealand last season, but were not generally successful. It is possible that the varieties most suitable to the New Zealand climate were not tried. Small quantities will again be tried this year. The seed is stocked in small quantities by some seedsmen." Address: New Zealand.

282. *Evening Post (Wellington, New Zealand).* 1914. Commercial and financial. Jan. 21. p. 4.
• ***Summary:*** The section titled "Oils, etc." discusses the worldwide supply of, demand for, and price of various vegetable oils (especially linseed oil) based on an article in *Oil Trade Review.* "Much depends upon the attitude of Europe, as this will determine the future prices for linseed and linseed oil. The value of soap-making oil, such as cottonseed, soya bean, coconut, etc., has to be taken into account, and should the quotations of these run below the parity of linseed oil, the demand for the latter might receive some check;..."

283. *Queensland Agricultural Journal.* 1914. The soya bean. 1(1):7-9. Jan. [3 ref]
• ***Summary:*** "Much has been written in the Australian Press during late years of the Soya bean as a profitable crop for farmers, and experiments have been made with it at the State Nursery at Kamerunga, but nothing has resulted from the experiments beyond proving that the soils and climate of some parts of Queensland are well adapted for the cultivation of this crop."

This article summarizes three articles received by the Department of Agriculture and Stock: (1) A communication from "Messrs. Thompson and Co., Dalny, South Manchuria, giving interesting information concerning the commercial possibilities of the [soy] bean, and suggesting that the Department experiment with the seed at the State Farms and in Western districts like the Marona, where the rainfall is comparatively small and uncertain, offering at the same time to supply the necessary seed, and, if the experiments proved successful, the firm would consider the taking up of a large tract of land in Queensland and growing the bean in quantity, as there would be no difficulty in disposing of the product. The present price of the beans in Europe is £9 per ton."

(2) "Messrs. Thompson and Co. furthermore enclosed an extract from the report (for 1912) of the Trades Commissioner for the Government of the Union of South Africa on the subject, which we summarise as follows,..." (see Turner 1914). The Queensland Journal then reflects: Profitability: "But the question to our mind is, whether, under our labor conditions, it would pay as well as it does in cheap-labor countries. A 1,000-lb. crop, at the highest prices for the beans, would sell for £4 10*s.* in Europe, and, deducting labour for production, freights, commission, &c., there would appear to be little in it to attract the attention of farmers, who can make far more [profit] out of dairying, sugar-planting, potato, onion, and maize growing. As a catch-crop amongst coconut and rubber trees, the Soya bean would doubtless prove of great value.

"As far as the feeding value of the [soy] bean is concerned, it is said to be at least twice as valuable for food as maize, as it is very rich in protein, but it is best fed in conjunction with maize. As a green manure, it is undoubtedly valuable in restoring the soil, being a leguminous plant.

"The expenses per ton for bags, railage, and freight to Harbin to Vladivostock [Vladivostok] are set down at £1 13*s.*; add ocean freight to England, £1 10*s.*–£3 3*s.*

"The expense of transport from South Africa to England is set down in the report we quote from at £1 9*s.*

"But Queensland is further from England than South Africa; and while it might pay to grow and export Soya beans thence to Europe, we cannot see that the crop could be profitably produced in this country."

(3) "The following summary of the uses of the Soya bean and its products given by *Tropical Life* [published in England], April, 1913 [p. 71-72], is interesting:–For dynamite and high explosives, soap, linoleum, India-rubber substitute, margarine, paints and varnishes, in place of linseed oil, various edible foods, toilet powder, salad oil, vegetable cooking oil in place of lard, oil, &c., preserving sardines, lamp oil, lubricating, as food in place of peas, flour for soups, biscuits, brown bread, artificial milk and

cheese [soymilk and tofu], substitute for coffee, for sauces; cake for feeding cattle, and for manure."

Note: In this same Jan. 1914 issue (p. 3) of this journal, an article titled "Queensland Agricultural Journal," states: "With this number of the Journal we commence a New Series of issue, dating practically from the 1st July 1913, on which date the Journal completed its sixteenth year of publication." It first appeared in July 1897, and today some 60,000 copies a year [5,000 copies a month] are mailed to subscribers worldwide. From now on the Journal will accept "advertisments having reference solely to productions of the land or to manufactured articles needed by rural occupiers, thus not interfering in any way with the general run of advertisements in the public Press." Address: Australia.

284. *Christian Science Monitor.* 1914. Queensland may raise soya bean. April 20. p. 3.
• ***Summary:*** "(Special to the Monitor). Brisbane, Queensland [Australia]. The attention of farmers in Queensland has been directed by the department of agriculture to the demand that exists for the soya bean, which is extensively used in the manufacture of cake for fodder purposes, and which can be grown successfully in Queensland."

Note: Soya beans were first cultivated in Queensland in about 1901.

285. Hill, W. Stanley. 1914. The soya bean: Experience at Moumahaki Experimental Farm. *New Zealand J. of Agriculture* 8:594-96. June 20.
• ***Summary:*** "The failure of several attempts made to grow this crop under field conditions at Moumahaki Experimental Farm led to consideration of the cause or causes of these failures. In previous seasons only one variety of bean–viz., the Early Yellow–was experimented with. During the season just passed six varieties have been fairly successfully grown under severe field conditions. They were sown on the 20th September, 1912." A table (p. 594) shows that the varieties were (with the weight of 100 seeds of each), in descending order of seed size: Giant Yellow Santa Margherita (28.56 gm), Early Yellow (24.60 gm), Green Samarow (15.34 gm), Arlington (10.58 gm), Brownie (9.14 gm), and Meyer (7.10 gm). For each is given the average height (inches), period of growth (days), colour of seed, and weight per 100 seeds.

"Until the season 1912-13 no nodular development existed on any Soya-bean plants harvested at Moumahaki. During that season these nodules were obtained by means of a commercial culture." Address: B. Agriculture, New Zealand.

286. *Mercury (The) (Hobart, Tasmania, Australia).* 1914. Rival to milk. Produce from soya beans. Romance of an industry. June 20. p. 14.
• ***Summary:*** This is a summary of: *Times* (London). 1914. "Artificial milk. Butter and cheese from soya beans. Romance of a new industry." March 17. p. 4. The summary begins: "The keen rivalry between margarine and butter is to have a parallel in the fluid product of the soya bean threatening to knock cow's milk out of the market."

287. *Board of Trade Journal (London).* 1914. Commonwealth of Australia. Denaturation of soya bean oil for paint making in Australia. 86:304-06. July 30.
• ***Summary:*** "It is also stated in the Supplement [No. 21 to the Customs Tariff Guide, 1908-11, dated 6 June 1914] that the following formula has been approved, under the provisions of By-Law No. 231, for the denaturation of soya bean oil for paint making:–Soya bean oil, 85 gallons; linseed oil, double boiled, 15 gallons. Oil so denatured may be delivered free of duty under Tariff heading No. 234 (H)."

288. *Poverty Bay Herald (Gisborne, New Zealand).* 1915. At a well-attended meeting of egg farmers in Christchurch... Jan. 19. p. 4.
• ***Summary:*** "... it was resolved to ask the Government if it would temporarily remove the duty on foods suitable for poultry, including pollard, bran, soya beans, and maize, until such time as the price of local products is again within their reach."

289. Green, A.W. 1915. Soya beans. *New Zealand J. of Agriculture* 10(5):418-19. May 20.
• ***Summary:*** "In the nursery of the Ruakura Farm of Instruction tests of new varieties of Soya beans have been conducted this season. The most striking feature of the tests was that where inoculated soil had been used there was exceptional nodule-development on the roots of the plants."

A photo shows "The soya-bean plots at Ruakura Farm of Instruction." Address: Ruakura Farm, New Zealand.

290. Benjamin, Maurice S. 1915. A note on the occurrence of urease in legume nodules and other plant parts. *J. of the Royal Society of New South Wales* 49:78-80. [4 ref]
• ***Summary:*** Urease was detected in the nodules of 17 plants in Australia, including *Glycine clandestina* Wendl. Address: D.I.C., Asst. Chemist, Hawkesbury Agriculturasl College.

291. *Bulletin Economique de l'Indochine (Hanoi).* 1915. Les exportations du Soja en Mandchourie [The exports of soya from Manchuria]. 18(115):773. Sept/Oct. Extract from Echo de Chine. [1 ref. Fre]
• ***Summary:*** "The quantities of soybeans forwarded from Dairen to the South China Sea by ships / vessels which offer regular service between Dairen, Shanghai, and Hongkong, to be expedited again to other destinations, increase significantly each year. The quantities in 1913 attained 3,061,336 kg; in 1914 they were only 2,976,049 kg, and for

the year 1915, the quantities already exported rose to 6,667,000 kg."

A table shows the imports of soybeans (in million kg) at the following ports in 1914 and 1915: Singapore (1.460 / 1.426), Hongkong (4.760 / 0.923), southern Chinese ports (36.946 / 13.580), Dairen (2.976 / 6.667), and Japanese ports (1.503 / 1.060). Note 1. In 1914 southern Chinese ports imported 77.5% of the total imports of 47.645. In 1915 the total imports dropped to 23,656, and southern Chinese ports imported 57.4% of that total.

"The Indies *(Les Indes)* had exported 49,705 kg to these different places in 1913, but since then, no new exportation has been done, the Indies sending all available soybeans into the city *(dans la Métropole).*"

"In the South China Sea, mainly in Malaysia and Oceania *(les Iles Océanique),* soybeans are used to prepare Chinese food sauces from certain special farms, and the residue is used as fertilizer on sugarcane plantations." Address: Hanoi.

292. *Otautau Standard and Wallace County Chronicle (Otago, New Zealand).*1916. The horrors of a German camp: Appalling report. Unspeakable cruelty to British prisoners. June 6. p. 7.
• ***Summary:*** During World War I, British inspectors were given limited access to German prisoner of war camps. This is a report of such visits to investigate the treatment of British prisoners of war. "The food with which they were supplied was bad and insufficient."

"When major Priestly arrived at Wittenberg Camp the allowance of bread was one kilo loaf for 19 men. Breakfast for the men, he says, consisted of black (acorn) coffee and bread. The bread contained a high percentage of potato, and was most unpalatable. Sometimes a thin soup was given for breakfast in place of coffee. The mid-day meal consisted of a soup made of potato flour, horse beans, soja flour, some form of grease, and a minimum of meat. Men would go for days without finding any meat in their bowl."

293. *Advertiser (The) (Adelaide, South Australia).*1916. Milk substitute. July 3. p. 6.
• ***Summary:*** "The South Australian Trade Commissioner in London, writing on May 18, said:- 'I have been shown a liquid manufactured from soya beans, which in appearance resembles milk, and which has, I understand, many of the chemical properties usually found in milk. The finished product inspected was the outcome of the investigations of a company that has a manufacturing plant installed in London, and that is hopeful of working up an industry. At present the product is undergoing an examination by one of the leading American houses in London, with a view of testing, from a commercial standpoint, the advisability of placing, it on the market. It is through their courtesy that I was permitted to see a sample, and I have also been promised full particulars regarding any further developments in this alleged discovery, and will watch the progress of the investigations with interest.'"

294. *Argus (The) (Melbourne, Victoria, Australia).*1916. Women to women: Soya bean. July 26. p. 12.
• ***Summary:*** "'Chandos' (Middle Park) asks if any of my readers can tell her how to cook the Japanese bean known as the Soya bean."

295. Lonsdale, T.W. 1916. Soya-bean variety test. *New Zealand J. of Agriculture* 13(2):140. Aug. 21. Summarized in the Bulletin of the Imperial Institute. 1917. 15:121.
• ***Summary:*** An experiment at the Moumahaki Experimental Farm, New Zealand, with nine varieties of Soya beans obtained from Purdue University (in Indiana, USA) and planted on 12 Oct. 1915. The varieties tested in descending order of seed yield (60 lb/bushel) were: Auburn (45 bu/acre), Ito-San (38), Mikado (28), Early Brown (27), Black Beauty (24), Sable (24), Tashing (21), Hollybrook (20), Morse (14). The Auburn variety also gave a high yield of forage (13.14 tons per acre), which was equalled by Sable and only surpassed by Early Brown, which gave 14.28 tons per acre. The soil in which the plants were grown was manured but not inoculated, and "no sign of nodules was observed on any of the varieties. The manure applied per acre was 8 tons farmyard, 4 cwt. Ephos phosphate, ½ cwt. sulfate of potash, and ¼ cwt. sulphate of ammonia." Note: 1 cwt = hundredweight = 112 pounds. A table shows the results, including number of seeds per pound, length of straw in inches, and colour of seed. Address: Manager, Moumahaki Experimental Farm.

296. Piper, C.V.; Morse, W.J. 1916. The soy bean, with special reference to its utilization for oil, cake, and other products. *USDA Bulletin* No. 439. 20 p. Dec. 22. [9 ref]
• ***Summary:*** Contents: Introduction. Soy beans in Manchuria. Soy beans in Japan. Soy beans in Europe. Soy beans in the United States. Methods of oil extraction. Soy-bean meal as human food. Soy-bean meal as stock feed. Soy-bean meal as fertilizer. Uses of soy-bean oil. Analysis of important varieties of soy beans. Possibility of developing a manufacturing industry with American-grown soy beans.

"Analyses of important varieties of soy beans (p. 16-17):... In determining the range in the oil and protein contents of over 500 varieties grown in the variety tests at Arlington Farm, Virginia, the percentage of oil was found to range from 11.8 to 22.5 [Tokyo had 20.7% and Biloxi had 20.3% oil] and of protein from 31 to 46.9 [Chiquita had 46.9% protein]... At the present time the Mammoth Yellow variety is the most generally grown throughout the South and is the one used in the production of oil. The yellow-seeded varieties, which are most suitable for the production of oil and meal, contain the highest percentage of oil.

"Environment has been found to be a potent factor in the percentage of oil in the same variety. Considerable differences occur in oil content when soybeans are grown in different localities. The Haberlandt variety grown in Mississippi, North Carolina, Missouri, Virginia, and Ohio gave the following percentages of oil, respectively: 25.4, 22.8, 19.8, 18.3, 17.5; while the Mammoth Yellow variety grown in Alabama, South Carolina, Tennessee, North Carolina, and Virginia gave, respectively, 21.2, 19.6, 19.5, 18.4, and 18.8. Variety tests conducted in various parts of the country indicate a higher percentage of oil with the same variety for southern-grown seed. Similar results have been obtained in Manchuria, the North Manchurian beans showing an oil content of 15 to 17 percent and the South Manchurian beans from 18 to 20 percent."

Photos (both by Frank N. Meyer) show: A fleet of junks carrying soy beans to Newchwang, Manchuria (p. 2). Coolies at Newchwang, carrying loads of soy beans from junks to big stacks (p. 10). An outline map of the USA (p. 8) shows the area to which the soy bean is especially adapted for growing for oil production. The area of double hatching shows that it is especially well suited to the Deep South. The northern boundary of the area were it is "less certain of profitable production" includes the southern one-third of Ohio, Indiana, and Illinois, and most of Missouri. On the west, the "less certain" area includes the eastern one-third of Nebraska, Oklahoma, and Texas.

Tables show: 1. "Exports of soy beans, bean cake, and bean oil from the principal ports of South Manchuria (Antung, Dairen, Newchwang), 1909 to 1913, inclusive." 2. "Quantity and value of exports of soy beans and soy-bean oil from Japan to foreign countries, 1913 and 1914." The countries are: China, United Kingdom, France, Germany, Belgium, United States, Hawaii, British America, Australia, other countries. 3. "Quantity of imports of soy beans, soy-bean cake, and soy-bean oil from Dairen, Manchuria, into Japan, 1911 to 1914, inclusive. The greatest imports were of soy-bean cake, followed by soy beans, with only small amounts of oil.

(4) "Quantity and value of imports of soy beans, bean cake, and bean oil by European countries, 1912 to 1914, inclusive." The countries are: Austria, Belgium, France, Germany, Italy, Netherlands, Russia, Sweden, United Kingdom. In 1912, the UK imported the most soy beans, while Netherlands imported the most cake and oil. (5) "Quantity and value of imports of soy beans, soy-bean cake (Footnote: Includes bean cake [perhaps fermented tofu or canned regular tofu], or bean stick [perhaps yuba], miso, or similar products, with duty, 40 per cent) and soy-bean oil into the United States, 1910 to 1915, inclusive." The quantity of soy bean imports was greatest in 1915 with 3.837 million lb. The quantity of soy-bean cake imports was greatest in 1913 with 7.005 million lb. The quantity of soybean oil imports was greatest in 1911 with 41.106 million lb. "Prior to 1914 soy beans were not classified separately in the customs returns" (p. 9). (6) "Composition of soy-bean flour in comparison with wheat flour, corn meal, rye flour, Graham flour, and whole-wheat flour."

(7) "Value of a short ton of soy-bean cake and other oil cakes in the principal European countries" (Incl. cottonseed, linseed, peanut {Rufisque}). Countries: Germany, United Kingdom, Netherlands, Denmark, Sweden. (8) "Analyses [nutritional composition] of soy-bean meal and other important oil meals." (Incl. Cottonseed, linseed (old and new processes), peanut (decorticated), sunflower seed). (9) "Fertilizing constituents [nitrogen, ammonia, phosphoric acid, potash] of soy beans, soy-bean meal, and cottonseed meal."

(10) Analyses for protein and oil of important varieties of soy beans grown at Arlington Farm (Virginia), Newark (Delaware), and Agricultural College (Mississippi). The varieties are: Mammoth, Hollybrook, Manchu, Haberlandt, Medium Yellow, Ito San, Chiquita, Tokyo, Lexington, Guelph, Black Eyebrow, Shanghai, Peking, Wilson, Biloxi, Barchet, Virginia. Note 1. "At the present time, the Mammoth Yellow variety is most generally grown throughout the South and is the one used in the production of oil" (p. 16). (11) "Acreage, production, and value per ton of cottonseed in the boll-weevil states." "Since the boll weevil first entered Texas in 1892," it has steadily decreased production of cottonseed. The soy beans offers a good replacement. (12) "Comparative prices per ton of cottonseed and soy beans on the European market, 1911 to 1914, inclusive." Soy beans are usually slightly more expensive.

Note 2. This is the earliest published document seen that contains soy-related photos by Frank. N. Meyer.

Note 3. This is the earliest document seen in which William Morse describes soy milk, or mentions natto, or correctly mentions tofu.

Note 4. This is the earliest document seen (Sept. 2004) that mentions the soybean varieties Biloxi or Lexington. Address: 1. Agrostologist in Charge; 2. Scientific Asst. Forage-Crop Investigations, USDA, Washington, DC.

297. Gilder, Percy George. comp. 1916. The farmers' handbook. 2nd ed. Sydney, NSW, Australia: New South Wales Dept. of Agriculture. vi + 886 p. Illust. 26 cm. *
• ***Summary:*** In Section VII, "Leguminous crops" (p. 524-65), soybeans are discussed on p. 548. Address: New South Wales, Australia.

298. *Queensland Agricultural Journal.* 1917. Weak points of soya beans. 7(1):7. Jan. [1 ref]
• ***Summary:*** "As we have often pointed out, soya beans have their weak points. These are chiefly two. The seed rapidly deteriorates in germination. It is generally unwise to

use seed over one season old, and it should not be covered to a depth of over 1½ inches. The greatest weakness of the crop is the difficulty of getting good stands. The other serious weakness is that unless it is cut at the right time and handled properly, the beans 'pop' out or shatter badly in harvesting. They must not be allowed to get too ripe.

"The only safe plan is for each farmer to grow a small acreage until he learns how to handle the crop.–*The Progressive Farmer*" [USA]. Address: Australia.

299. *Poverty Bay Herald (Gisborne, New Zealand).*1917. Some prohibited imports [to the UK during World War II]. Feb. 26. p. 8.

• ***Summary:*** "(Australian and N.Z. Cable Association.) London, February 25. In addition to the articles Mr. Lloyd George mentioned, the *Gazette* prohibits the importation of... soya beans, sugar, tea, typewriters, wine of all kinds,..."

"The prohibition operates forthwith. It does not apply to goods imported under Board of Trade license.

"Mr. Lloyd George's speech gave rise to the impression that meat imports would be severely restricted, but this is unfounded, and the *Gazette* does not mention meat."

300. *Poverty Bay Herald (Gisborne, New Zealand).*1917. Neutrals [Neutral nations in Europe during World War I]. June 27. p. 2.

• ***Summary:*** "The action of the United States government in taking authority from Congress to regulate the export of merchandise to neutral countries is one of significance. It means a tightening of the blockade which is slowly but surely strangulating Germany.

"Britain by placing a restriction on the export to Holland, Norway, Sweden and other countries contiguous to Germany and bargaining with those countries that they shall take from her only what is required for their immediate use has greatly reduced the amount of produce that has got through to the Central Empires."

"Before the war England received 5,700 tons of Dutch eggs; last year she obtained a miserable total of 790 tons, whilst Germany's supply rose from 15,000 to 30,000 tons. Britain needs potatoes badly. Yet last year her supply from Holland fell from 132,000 tons to 5,000 tons, while Germany's fell from only 154,000 to 122,000 tons. The inference from these figures is obvious: Holland favors the enemy,..."

"Denmark, it is declared, is little better than Holland. Soya beans are valuable for making cattle cake and also probably for the oil that they contain, and Denmark is importing 150 per cent. more than she did before the war. Denmark is fattening cattle for German consumption, and whilst we are allowing ships to carry the feeding stuff, the Dane is sending fattened cattle into Germany–as many as 8,000 a week."

301. *Northern Territory Times and Gazette (Darwin, NT, Australia).*1918. Cookery: A good Worcester sauce. Jan. 5. p. 14.

• ***Summary:*** "Pound and mix together ½ oz. of cayenne pepper and 1-8oz. [1/8 oz.] of garlic in a mortar, and add to them gradually one quart of white vinegar. When thoroughly mixed pass all through a hair sieve. Add a gill of Indian soy, then bottle and cork securely for use."

302. Falk, Bernard. 1918. Prospering Harbin: Town of rich refugees. *Poverty Bay Herald (Gisborne, New Zealand).* Sept. 7. p. 8.

• ***Summary:*** "Harbin, June 25. Harbin is the Manchurian Babylon. It has a population of 130,000 of all the races under the sun. The town is wallowing in prosperity, refugees from Russia having brought all their wealth with them and invested it in various enterprises. In addition, the town is the center of the soya bean industry, which is assuming vast proportions. Innumerable things can be made from the soya bean, principally foods.

"There is much illicit opium smuggling... As a [Russian] rouble [ruble] changes in value three times a day, it it is possible for ingenious financiers to coin money. It is often a question of who gets to the bank first. People who are not occupied in business apparently live by card-playing for high stakes.

"It is a picturesque spectacle in the afternoon to see Russian officers attired in the most magnificent gold-braided uniforms diving with smartly-dressed lady friends in the new town, where the consulates are situated..."

303. *Proceedings of the Linnean Society of New South Wales.*1918. Ordinary monthly meeting. October 30th, 1918 [Exhibition of soy beans grown in New South Wales, Australia]. 43:610-11. [2 ref]

• ***Summary:*** Mr. E. Cheel exhibited "a series of seeds of 'Soy Beans' *(Glycine hispida)*, which originated from a form known in the trade as 'Ebony Soy.' The mother-plant 'Ebony Soy,' is a black-seeded form, which has been cultivated for four years, and has bred true. In the fifth year, one of the plants gave seeds of a greenish-yellow colour and distinctly green seeds in the same pods. This was distinguished under the name 'Australia.'"

304. *International Institute of Agriculture, Bureau of Statistics (Rome), Review.*1918. International trade in concentrated cattle foods. No. 4. 72 p. Nov. [1 ref]

• ***Summary:*** This is the IIA's fourth review on concentrated cattle foods. "The first three reviews were published in the *International Review of the Science and Practice of Agriculture*, in the numbers of April 1915, 1916, and 1917." This publication is divided into six chapters. In Chapter 4, titled "Oil seeds and oilcake" the section on "Soya beans and soya cake" contains statistics on three subjects:

Production, trade, and prices. Tables show: (1) "Produce in soya cake in the importing countries (estimated on the basis of the quantities of soya beans available) (p. 51). Figures are given in quintals for the years 1913-1917 for the following countries: Denmark, Great Britain and Ireland, Netherlands, Russia (including Asiatic provinces), China, Formosa, Japan, Dutch India (Java and Madura), and New Zealand. The top 3 countries in 1917 are: Japan 727,418, Denmark 284,000, and Great Britain and Ireland 223,969. However in 1915 Great Britain and Ireland produced 1,513,059. Note: 1 quintal = 100 kg.

(2) "Foreign trade in soya cake" (p. 51). Statistics are given in quintals for the years 1913-1917. Import figures are given for Denmark, Canada (incl. soya beans), Formosa, and Japan. Japan was by far the biggest importer, with 9,912,850 quintals in 1917. Export figures are given for Denmark, Great Britain, and China. China was by far the biggest exporter with 7,034,459 quintals in 1916.

Canadian imports of soya cake (including soya beans) was as follows (in quintals) for each financial year (p. 51): 2.345 in 1913. 2.412 in 1914. 1.121 in 1915. 1.358 in 1916. 4.730 in 1917. Note: This is the earliest document seen (Jan. 2010) that gives Canadian trade statistics for soybeans or soy products. This document contains the earliest date seen (1913) for trade of such products to or from Canada.

(3) "Foreign trade in soya beans" (p. 51). Statistics are given in quintals for the years 1913-1917. Import figures are given for Denmark, Great Britain and Ireland, Netherlands, Russia (incl. Asiatic provinces), Sweden, Formosa, Japan, and Dutch India (both Java and Madura, and Other possessions). The biggest importers in 1917 were: Japan 841,942, and Great Britain and Ireland 254,510. Export figures are given for Netherlands, China, Formosa, and Japan. China was by far the biggest exporter with 5,315,324 quintals in 1916.

(4) Foreign trade in sundry and unspecified oilcakes (p. 62). Gives imports statistics for soya cake by Roumania [Romania]: 79,378 quintals in 1913, 36,650 quintals in 1914, 5,554 quintals in 1915. Gives export statistics for soya cake by Russia: 54 quintals in 1913.

(5) "Prices of sundry oilcakes at the close of each week" (p. 55-56). For soya cake, the prices are given at Copenhagen, Denmark, for 1917 and 1918 in gold francs. The price rose by about 41% between Jan. 1917 and Jan. 1918 from 46.47 to 62.16 gold francs.

(6) "Other vegetable products" (p. 71). In 1913 Denmark exported 1,390 quintals of soya meal.

This document also contains extensive information on groundnuts and groundnut cake, sesamum and sesamum cake, etc.

Note 1. This is the earliest English-language document seen (Aug. 2000) that contains the word "oilcakes." Note 2. This is the earliest English-language document seen (Jan. 2001) that uses the word "quintals" (or "quintal") in connection with soybeans. Address: Rome, Italy.

305. *Poverty Bay Herald (Gisborne, New Zealand).*1918. Seattle oil dock swept by flames: Loss estimated at £400,000. Dec. 10. p. 7.

• ***Summary:*** Seattle, Oct. 16. At 11 o'clock last night, flames burst out on the Great Northern oil piers. By this morning, they were under control, though still burning fiercely. "Flame from the burning soya bean, peanut and rape-seed oil leaped hundreds of feet in the air and lighted up the entire bay coast."

"The Mitsui Company, Limited, who owned much of the oil, say their losses will reach £300,000. All losses were well covered with insurance."

306. Gilder, Percy George. comp. 1918. The farmers' handbook. 3rd ed. Sydney, NSW, Australia: New South Wales Dept. of Agriculture. vi + 901 p. See p. 560. Illust. 25 cm. 4th ed. was 1922. 5th ed. was 1943.

• ***Summary:*** Section 7, "Leguminous crops (p. 536-77), has the following contents: Introduction. Lucerne [alfalfa] (now the chief leguminous crop of NSW). Cowpeas. Soy beans. Peanut. Field peas. Vetches and tares. Autumn-sown legumes combined with cereals (vetches and tares, field peas). Clovers (the 3 basic types are perennial, biennial, and annual, and there are several varieties of each, in the genera *Trifolium* and *Medicago).*

The subsection on soybeans (p. 560) states: "'On paper' there is no question about the value of soy beans as a farmer's crop. American experience is that compared with cowpeas they are more valuable as a grain producer, are hardier and more drought-resistant, can be grown earlier and later in the season, thus ensuring a longer succession of feed, and produce a grain much richer in protein. Unfortunately they do not do well in New South Wales. Numerous experiments have been carried out by the Department with a view to obtaining a variety suited to our conditions, but so far these have all proved unsuccessful.

"A typical case is that of experiments conducted in October, 1911, when seeds of a variety supposed to be especially suited to our conditions were obtained from Victoria. The results have been very briefly summarised in the following table:"

This table contains three columns: District, weather conditions &c., result. (1) Bonville, North Coast (NC). Dry. All but one seed failed to germinate. (2) Wollangbar, NC. Dry. Seeds failed to germinate. (3) Richmond, NC. Dry. Completely eaten off by rabbits and hares, while cowpeas sown with them were untouched. (4) Unanderra, South Coast (SC). Dry. Only as much seed saved as sown. (5) Bathurst, SC. Irrigated. 50 per cent. germinated. (6) Tamworth, SC. Dry. No results obtained. (7) Cowra, SC. Hot and dry. When plants were 12 inches high all plants died off without producing any seed. (8) Wagga, SC. Moist, then hot and dry. Such plants as germinated died off during hot weather. (9) Albury, SC. Dry. Bad germination, and all plants died. (10) Yanco, SC. Good conditions. Bad germination; weak plants and only a few seeds saved. (11) Nyangan, SC. Ample rain to cause germination, but dry later. Weight of crop one-thirtieth that of black cowpeas.

"As a fodder plant for the dry districts of this State, according to the opinion of Mr. H.J. Kelly, Manager of Nyangan Demonstration Farm, the soy bean is not nearly so suitable as the Black cowpea, which is a much better drought resister and a quicker and much more vigorous grower, and productive of a much greater quantity of fodder." Address: Editor, *Agricultural Gazette* [New South Wales, Australia].

307. Shih, Chi Yien. 1918. Beans and bean products. Shanghai, China: Soochow University Biology Dept. 13 p. 24 cm. [Eng]

• ***Summary:*** The author's name in pinyin is probably Shi Jiyan. At the head of each section, the name of each product or type of bean is written in Chinese characters. Contents: Introduction by N. Gist Gee of the Dept. of Biology, Soochow Univ., China. Note 1. Soochow, also called Su-chou (formerly Wuhsien) is a city in southern Kiangsu (pinyin: Jiangsu) province, in eastern China, on the Grand Canal. Introduction and names of soy beans: Classical Chinese names, colloquial Chinese names, Latin names, and English name (Soja bean). Soy beans. The food products of soy beans. Bean curd (Cc). Tou fu koen. Po yeh. Yu tou fu. Ju fu. Tsao ju fu. Ch'ing hsien ju fu. Tou chiang or bean sauce. Chiang yu. Bean ferment or tou huang. Bean Sprouts. Bean relish or tou shih [soy nuggets]. Bean oil. Note 2. *ju fu* refers to fermented tofu.

Beans (Four varieties of *Phaseolus mungo* var. *radiatus:* chidou = dark-red [azuki] bean, baichidou = white dark-red bean, lüchidou = green red bean, and lüdou = green [mung] bean): The food products from the green [mung] beans (lüdou): Bean sprouts, green bean congee or lu tou chou, green bean soup or lu tou tang, green bean pudding or lu tou kao and lu tou sha. The food products from the red [azuki] bean (quite similar to those made from the green [mung] bean): Congee, rice, pudding, tou sha.

Hyacinth beans *(Dolichos lablab;* five Chinese varieties / names: biandou, baibiandou, qingbiandou, zibiandou, longzhao biandou). Asparagus beans [cowpeas] *(Vigna catiang;* four Chinese varieties / names: jiangdou, panxiang jiangdou, manli jiangdou, baimi jiangdou). The food products from Pien Tou and Chiang Tou. Medicine. Flowers and seeds of the Pai Pien Tou, the broad bean, windsor bean, or horse bean *(Vicia faba);* In China it has two names: (1) Ts'an Tou or silkworm bean, because it is harvested at the time the silkworm is making its cocoon; (2) Han Tou or cold bean, because it grows through the winter. The food products from Ts'an tou (broad bean): Bean shoot (tou miao), Ch'ing tou (as a vegetable), Ja tou (broad bean sprouts), Shien fan and fan bee (made from broad beans and mung beans), Tou sha. The section on the names of beans (p. 1) we will give the English name, Latin name, the classical Chinese names / colloquial Chinese names, and an English translation in parentheses, as follows: (1) Soja bean, *Glycine hispida:* heidou / heidou (black [soy] bean), huangdou / huangdou (yellow bean), yangyandou / yangyandou (sheep eye bean), maliaodou / maliaodou (horse material / feed bean),–/ guguo qingdou (bone wrap green bean),–/ jiajia sandou (pod pod three bean), xiangsidou (mutually think bean) / xiaqngzhidou (fragrant branch bean),–/ bayue baidou (8th month white bean). Soja bean: *Dolichos cultratus* quedou (magpie bean) / equedou (chirp magpie bean). Soja bean: *Phaseolus vulgaris* baidou (white bean) / shui bai dou (water white bean),–/ shidou (fennel bean) (Note 3. shiluo means "fennel"),–/ guashudou (melon ripe bean),–/ maquedou (sparrow bean),–/ niuta biandou (cow tread flat bean),–/ yadou (sprout bean),–/ shijia xiangdou (ten family fragrant bean),–/ xifeng qingdou (west wind green bean),–/ shizi hedou (persimmon pit bean),–/ denglongdou (lantern bean).

Note 4. The large title "Soy Beans" at the top of this table, the right column which says that the English name of each variety is "Soja bean," and the next 8 pages which are only about soy beans, strongly indicate that all the colloquial names in this table refer to different varieties of soy beans. Moreover, all these colloquial names appear again on page 3 in a table on planting and harvest times of different varieties of [soy] beans. The bottom half of the colloquial names are probably from different parts of China, since Dr. H.T. Huang (a soybean expert) has never heard many of these colloquial names before. The most puzzling question is: What are *Dolichos cultratus* and *Phaseolus vulgaris* doing at the bottom of the "Latin name" column? *Dolichos cultratus* is not listed on either of the two comprehensive taxonomy databases (GRIN and ILDIS, which include all past Latin / scientific names). *Phaseolus vulgaris* refers to the common bean, such as the kidney bean, pinto bean, navy bean, frijole, etc.

2. Soy beans. "They were introduced into France during the reign of Ch'ien Lung about 1740 A.D. by a French Consul; into England in 1790, into Australia in 1875, into Germany 1881, and 1888 into America. They were known here from ancient times and were mentioned in the oldest books Pên Ts'ao Kong Mu, which were written by the Emperor Shen-nung in the year 2838 B.C., and the later Chinese Classics."

Note 5. This is the earliest English-language document seen (Aug. 2002) that treats Shen Nung as a real, historical figure, or that says the first written record of the soybean appears in a book written by him. The information about that book is wildly inaccurate. The *Bencao gangmu* (The great pharmacopoeia), perhaps China's most famous materia medica, was written by Li Shizhen (+1596). The above information, which is all wrong, has been cited again and again, down to the present day (2002), in connection with the supposed origin of the soybean.

"Even during the ancient times they were considered by the people to be the most important of the cultivated leguminous plants." Note 6. This is the earliest document seen (Aug. 2002) which gives, incorrectly, that the date of Emperor Shen-nung's book as 2838 B.C.

"The methods of cultivation are as follows: In general all of the soja beans are planted in rows along the banks of canals and the boundaries of the fields, which separate the fields of one family from those of another, except those which are called oil beans or Eighth month white bean and Water white bean. These last are planted in large fields. The oil beans are planted early in June." The method of cultivation, harvest, and threshing is then described in detail. A table gives the time of planting and harvest for 18 varieties of Chinese soybeans, grouped into 6 types by planting and harvest dates: (1) Plant in latter part of April, harvest in latter part of Sept.: *Heidou* (black [soy] bean), huangdou (yellow bean), *maliaodou* (horse material / feed bean), *guguo qingdou* (bone wrap green bean), *jiajia sandou* (pod pod three bean), *xiangzhidou* (fragrant branch bean). (2) Plant in early part of June, harvest in middle part of Sept.: *bayue baidou* (8th month white bean), *shuibaidou* (water white bean), *maquedou* (sparrow bean). (3) Plant in early part of July, harvest in early part of Oct.: *equedou* (chirp magpie bean), *niuta biandou* (cow tread flat bean), *shijia xiaudou* (ten family fragrant bean), *xifeng qingdou* (west wind green bean), *shizi hedou* (persimmon pit bean), *denglongdou* (lantern bean). (4) Plant in early part of April, harvest in early part of July: *guashudou* (melon ripe bean). (5) Plant in early part of April, harvest in latter part of July: *shidou* (fennel bean). (6) Plant in early part of April, harvest in latter part of June: *yadou* (sprout bean).

The rest of the work concerns the food products of the beans, including a detailed description of how each is made.

Note 7. This document contains the earliest date seen for soybeans in Australia or Oceania (1875). It is not clear whether or not these soybeans were cultivated in Australia; they may well have been. The source of these soybeans is unknown, as is the author's source of information concerning that early introduction, 43 years before Shih wrote this booklet. He is the first to give such an early date for the introduction of soybeans to Australia. Yet the date does not seem unreasonably early since there were 17,000 Chinese in Australia by 1855 (see Australian Department of Immigration and Ethnic Affairs. 1985. "A Land of Immigrants"). Address: Biology Dep., Soochow Univ., China.

308. *Commerce Reports [USA] (Daily Consular and Trade Reports, Bureau of Foreign and Domestic Commerce, Department of Commerce).*1919. Commercial items from Japan. 22(121):973-74. May 23.

• ***Summary:*** "Japan exports bean oil chiefly to Australia, England, and the United States, and the amount exported has greatly increased during the past five years. In 1914 exports were valued at $724,284, while in 1918 they were valued at $3,430,483"–a 4.7-fold increase.

"The amount of Japan's bean cake output during the past year was valued at $6,100,000."

309. Groves, C.L.D. 1919. Re: Thanks for sending the soya-beans. Letter to George Washington Carver, Tuskegee Institute, Tuskegee, Alabama, Nov. 1. 2 p. Typed, with signature. [1 ref]

• ***Summary:*** "It is with sincerest thanks, that I acknowledge the receipt of your letter and package of Soya-beans, they were sent on to me at the address. Since first writing you, I have had to return to this country for my health, and expect that the course of treatment I have to undergo will be completed in about a years time. My God, Sir, you are a great crowd, taking such an interest in a casual inquirer as myself..."

P.S. "The Beans I have returned to Australia to the Man looking after my property, with instructions to plant them out and advise me of the result."

Location: Library of Congress, Washington, DC. Microfilm of The George Washington Carver Papers in the Tuskegee Institute Archives, Roll 6 #0364. Address: Lieut., "Villa Rosa," Willingham, Cambridgeshire, England.

310. Mattei, G.E. 1919. La soja ed i suoi prodotti [The soybean and its products]. *Bollettino di Studi ed Informazioni del Regio Giardino Coloniale di Palermo* 5(1/2):1-34. [40 ref. Ita]

• ***Summary:*** This article contains one of the best histories seen to date of the soybean in Italy, from 1760 to 1813. Contents: Brief history of the soybean. History of its taxonomic classification. Botanical description of the wild and domestic soybean. Varieties. Introduction of the soybean to Europe (especially France and Italy). The question of the root nodule bacteria. Cultural requirements. Importance / value of the production. Utilization of the seeds. Soy flour *(farina di soja)*. Soymilk *(latte di soja)*. Soy cheese [tofu] *(formaggio di soja)*. Soy oil *(olio di soja)*. Soy cakes *(panelli di soja)*. Other Japanese preparations: Miso, shoyu, koji. Opportunities for soybean cultivation in Italy. Results of cultural trials at the Colonial Garden *(Giardino Coloniale)* in Italy.

"Introduction of the soybean into Europe: The soybean *(La Soja)* was long confined to East Asia, and it is only towards the 17th century that it appears in the Indian Archipelago; in fact, if it had existed in the Pacific islands at the time of Cook's voyage, Forster surely would have reported it. Its introduction to the East Indies is even more recent. Roxburgh mentions its cultivation in the Botanical Gardens of Calcutta from seeds acquired from the Moluccas, in 1798. On the other hand, as Alphonse de Candolle observes, if its cultivation were ages-old, it would have spread long ago toward the West to Syria and Egypt, which did not occur.

"Its introduction to France is said to date back to 1739, when certain missionaries sent soybean seeds, from China, to the *Jardin des Plantes* in Paris: the uncertainty however arises as to whether, even before this time, it was cultivated in Europe, since, as Saccardo points out, it appears that essays *(saggi)* on the plant exist in the *Herbarium* of Bartolomeo Martini of Verona, Italy, written *(composto)* in 1701.

"In any event, concerning France, the soybean is reported as being grown extensively in about 1821 at Champ-Rond near Etampes; it seems, however, that subsequently its cultivation was nearly lost; in fact, Lachaume, in the *Revue Horticole* of 1857 [pages 568-70. Nov. 16], reports it as a new introduction, thanks to the French Consul in Shanghai, and he describes and illustrates it.

"As for Italy, Pinolini [1905] dates the soybean to 1848 [sic, 1840]. It is possible that its cultivation as an agricultural plant began to spread from that date, but the existence of the soybean in Italy antedates this date by at least a century. Saccardo says in fact: 'cultivated since the mid-18th century, and at times extensively, as in the Treviso region.'

"With the existence, as I have stated, of essays on the soybean in the *Herbarium* of Bartolomeo Martini of Verona, an herbarium written in 1701, one might suspect that from that time the soybean was being cultivated in the Verona region; but who could have brought the seeds? And if this were the case, why do we not find any reports of it in somewhat later authors? Or was the above-mentioned essay brought directly from the Orient. It should be noted that Kaempfer's voyage to Japan dates to 1690, and we have the first accurate reports on the soybean in 1712 with Kaempfer's own publication. Should we perhaps believe that some study, brought back by Kaempfer, was given to Martini? He might have obtained it from Zannichelli who, as Targioni-Tozzetti relates, in the life of Micheli, carried on a correspondence with Martini himself? Assuredly Kaempfer had to regard a plant which is used for so many purposes in Japan as important and it is possible he brought back essays about it, and perhaps even seeds.

"In any event, the Jardin des Plantes in Paris, after 1739, must have distributed seeds to various botanical institutions, including Italian. In fact, from the old *Catalogs (Cataloghi)* of the first Italian botanical gardens and from the pertinent *Index seminum,* we see that in the second half of the 18th century, the soybean is being cultivated almost everywhere: in 1760 Allioni mentions its cultivation in the Botanical Gardens of Turin; in 1780 Abbot *(l'Abate)* Farsetti introduced it to his Santa Maria di Sala garden near Venice; in 1785 Scopoli mentions it in Pavia; in 1787 Guatteri records it in Parma; in 1790, with the Botanical Gardens barely established, Tineo was cultivating it in Palermo, as results [show] from the Catalogue published in precisely that year; in 1793 Zuccagni refers to it in Florence; in 1798 Durazzo had introduced it into his garden Dello Zerbino near Genoa; in 1801 Tilli mentions it in Pisa; in 1805 Graefer refers to it in Caserta; in 1807 Arduino introduced it to the Agricultural Gardens *(Orto Agrario)* of Padua; in 1811 Fabriani refers to it in Modena; in 1813 Tenora points it out in Naples, and the same may be said for other more recent reports. From this we see that, at the end of the 18th century, the soybean was already cultivated throughout Italy, not for agricultural but for scientific purposes, that is, in Botanical Gardens.

"Perhaps this information escaped those, like Pinolini, who did research on the soybean as an agricultural plant because, in all works dealing with plants cultivated at that time, the soybean is found under the name of *Dolichos soja,* the generic name *Soja,* of Moench or Savi, not yet having been adopted."

In 1918 a soybean cultural trial was conducted at the Colonial Garden, Palermo, on a plot of 350 square meters; smaller experiments had been conducted in previous years. A variety was chosen which had almost spherical seed and was greenish yellow in color. The seeds were planted on March 29, in furrows at a spacing of 30 x 40 cm.; they germinated regularly about 10 days later. The plants were hoed twice to reduce weeds and irrigated eight times from the end of May until the end of August. Flowering began in early July and the seed was harvested on Nov. 15. The entire vegetative period was, therefore, 7½ months. The plants reached an average height of 90 cm. Their growth was luxuriant and there was a normal development of nodules on the roots. From this plot of 350 square meters, 51 kg of clean seed was harvested; this corresponds to a yield of about 1,450 kg/ha, which is considered quite satisfactory and could be increased by manuring. The beans, when cooked in different ways, were found to have an agreeable taste.

Talk with Ted Hymowitz, soybean geneticist, Univ. of Illinois. 2003. Aug. 18. Caution! It is not clear whether the early dates for soybean in Italy this article are based on herbarium specimens or living plants. With herbarium specimens, it is easy to make errors.

Note 1. This document contains the earliest solid dates and the second earliest overall dates seen (Aug. 2003) for soybeans in Italy, or the cultivation of soybeans in Italy (1760). The source of these soybeans is unknown. Yet note that the earliest possible date that the soybean was cultivated in France was about 1740. Perhaps there was some connection between the earliest possible soybean cultivation in France and in Italy.

Note 2. This article was reprinted in the Nov. 1991 issue of *Il Giornale della Soia* (p. 11-16). Address: Royal Botanical Garden (R. [Regio] Orto Botanico), Palermo, Italy.

311. Rock, Joseph F. 1920. The leguminous plants of Hawaii: Being an account of the native, introduced and naturalized trees, shrubs, vines and herbs, belonging to the family Leguminosae. Honolulu, Hawaii: Experiment Station of the Hawaiian Sugar Planters' Association. x + 234 p. Illust. Index. 25 cm. [1 soy ref]

• ***Summary:*** The section on the genus *Glycine* (p. 176-77) begins with a botanical description of the genus. "About fifteen species in tropical Africa, Asia, and Australia. Most cultivated species is *Glycine max* (Linn.) Merrill." Listing of five changes in the botanical name of the soybean (1753-1917). Botanical description of the soy bean. General description: "The common Soy bean, a native of India and eastern Asia, but now widely cultivated... It was introduced into England in 1790 and into Italy in 1848. The seeds of the Soy bean vary greatly in color, yellow, red, brown, black, green, or variegated." Note: This is the earliest English-language document seen (Sept. 2004) that uses the word "variegated" (or "variegation") to describe the color of soybean seeds.

A good source of information is P. de Sornay's *Green Manures and Manuring in the Tropics* (1916), which has concise information on cultivation, yield, etc.

Contains many full-page black-and-white photos, but none of the soy bean. Also discusses: Alfalfa (p. 141). Peanut (p. 156). Kudzu *(Pueraria,* p. 203, 205). Address: Prof. of Systematic Botany, College of Hawaii, Consulting Botanist, Board of Agriculture and Forestry.

312. Adkins, Dorothy Margaret. 1921. The soya-bean problem. *Science Progress (London)* 15(59):445-51. Jan. [9 ref]

• ***Summary:*** This is a popular article. Contents: Introduction. Practical applications of the bean: Food uses include Tofu, or bean cheese (Japanese), Miso similar to chiang (Chinese), Shoyu (Japanese) and chiang-yu (Chinese), Natto (Japanese), whole dry soybeans, soybeans canned as a green vegetable (see description below), vegetable milk, roasted soybeans as a coffee substitute, soya flour, soya in diabetic diets and macaroni. Utilisation of soya-bean oil: In Italy, China, Manchuria. Utilisation of soya-bean cake and meal: As fertilizer in China and Japan, for feeding stock. Food value of the bean. The cultivation of the soya bean: China, Japan, United States, Australia (New South Wales), South Africa, West Indies, British East Africa, West Africa, Burmah [Burma], England.

"In Japan beans are germinated until the sprouts are about five inches long, and eaten with vinegar; beans, germinated and treated with brine, have also been noted in Spain." Note: It is not stated clearly that these beans in Japan or Spain are soya beans.

"Soya-beans may be cooked and used in the same way as haricot-beans, and may also be picked when young and treated like green peas, in which condition they may be canned."

"In South Africa success has been achieved in growing the plant; in 1910 the outlook was so hopeful that a project for constructing oil mills was suggested. Unfortunately the bean was not taken up by farmers, who preferred to cultivated maize, as it was an easier crop to produce. Thus no extensive culture of the bean was attempted, and the subject was dropped.

"In other parts of the Empire, for example the West Indies, British East Africa and West Africa, trials of soya-beans have proved successful, but in no district have promising early experiments been followed by tests on a larger scale."

"In certain parts of India, for example Burmah, soya-beans are grown on a large scale and are consumed by the natives." Address: Royal Holloway College, London.

313. Grinenco, Ivan; Capone, Giorgio. eds. 1921. Produits oléagineux et huiles végétales: Etude statistique sur leur production et leur movement commercial [Oleaginous products and vegetable oils: Statistical study on their production and trade]. Rome, Italy: Institute Internationale d'Agriculture, Service de la Statistique Générale. xxxii + 421p. See p. XX-XXI, 140-41, 144-47, 442-43, 480-81. Sept. 15. Index in front. [Fre]

• ***Summary:*** In Sept. 1921 the IIA *(Institute Internationale d'Agriculture)* published this monograph in French. Two years later, by popular demand, an updated English-language edition was published. Contents: Introduction. Northern hemisphere: Europe, America, Asia, Africa, Oceania (Hawaii, Guam). Southern hemisphere: America, Asia, Africa, Oceania. Recapitulative tables of commerce, 1910-19. Note 1. All import and export statistics are given in quintals. 1 quintal = 100 kg.

The soybean (introductory information, p. xxii-xxiii, xxxii). Northern hemisphere–Europe. Germany (imports of soybean and soy oil 1910-14, p. 4). Denmark (production of soy oil in 1917, p. 17; imports and exports of soybeans and soy oil 1910-19, p. 18-20). France (imports and exports of soybeans and soy oil 1910-19, p. 28-31). Great Britain and Ireland (treated as one country; imports, exports, and reexports of soybeans and soy oil 1910-19, p. 32-35). Norway (imports of soybeans 1910-19, p. 47). Netherlands (Pays-Bas, imports and exports of soybeans and soy oil 1910-19, p. 49-52). Romania (In 1915 production of soybeans on 3 hectares was 3,600 liters). Russia (in Europe and Asia, imports of soy oil 1909-17, p. 70-71). Sweden (imports and exports of soybeans and soy oil 1910-19, p. 74-76).

Note 2. This is the earliest document seen (Jan. 2009) that gives soybean production or area statistics for Eastern Europe.

America: Canada (imports of coconut, palm, and soy oil {combined} for the production of soap {in hectoliters} 1915-19, p. 88-89). Cuba (various attempts have been made to introduce the soybean, p. 94).

United States (area and production in 1909 {659 ha}, then from 1917-1920, p. 97-98). An overview of soybeans in the USA (p. 103, 105) states that the soybean, known in the USA since 1804, has become of great economic importance during the past few years. It is becoming popular mainly as a forage plant, but also for its seeds, for extraction of oil, and for making other products. Statistics have been published regularly since 1917. The census for 1909 showed 659 hectares cultivated in soybeans. During the years from 1917 to 1919 the cultivated area surpassed 60,000 ha. The three main states for soybean cultivation are North Carolina, Virginia, and Mississippi, which in 1919 cultivated respectively 33,185, 12,141, and 3,238 hectares; this was almost 75% of the total cultivated to soybeans in the USA. In 1910, the seeds were used for the extraction of oil in the USA, and for the first time the seeds were imported from Manchuria. In 1915, domestically grown soybean were used as a source of oil. This industry is developing rapidly, because the extraction of the oil is easily adapted to existing facilities that press oil from cottonseed and linseed. A table (p. 106) shows production of 16 vegetable oils in the USA from 1912 to 1917. Soybean oil production (in quintals) has increased from 12,537 in 1914, to 44,996 in 1916, to 190,843 in 1917. Figures are also given for peanut oil, sesame oil, etc. Other tables (p. 108-10) show imports, exports, and reexports of soybeans and soy oil from 1910 to 1919.

Asia: China (exports of soybeans and soy oil 1910-19, p. 161-62). French Indo-China (overview, esp. Cambodia and Tonkin, p. 187). Japan (area planted and production of soybeans 1877-1919, p. 190; overview, p. 191; production of soy oil 1909-18, p. 192; imports and exports of soybeans and soy oil 1910-19, p. 192-93). Korea (area planted and production of soybeans 1909-1918, p. 194; imports and exports of soybeans and soy oil 1909-11, p. 195). Formosa [Taiwan] (area planted and production of soybeans 1901-06, p. 196; imports and exports of soybeans and soy oil 1909-17, p. 197. In 1901 10,888 ha produced 8,056,400 liters of soybeans. In 1904 21,960 ha produced 24,401,700 liters of soybeans). Note 3. This is the earliest document seen (Jan. 2005) that gives soybean production or area statistics for Formosa (Taiwan; ceded to Japan in 1895 after Japan won the Sino-Japanese War).

Kwantung [Kwantung Leased Territory in Manchuria] (area planted and production of soybeans 1911-17, p. 198. In 1911 14,627 ha of soybeans produced 102,112 quintals. In 1916 29,902 ha produced 153,995 quintals of soybeans).

Africa: Algeria (in recent years, trials have been made to introduce soybean culture to Algeria, p. 238). Egypt (imports of soy oil 1919, p. 244-47).

Southern hemisphere–America: (Note 4. Soy is not mentioned at Argentina, Brazil, or any other South American country). Asia: Netherlands Indies. (A) In Java and Madura, the area planted to soybeans was 162,800 ha in 1916, 175,696 ha in 1917, and 157,844 ha in 1918. Gives imports of soy oil (1,085 quintals in 1914) and exports of soybeans (46 quintals in 1913) (p. 297-98). (B) In outlying territories, gives imports of soybeans from 1913 to 1919 (p. 299). Africa: Southern Rhodesia (attempts have been made to introduce soybeans and several other oil plants from temperate climates, p. 317). Oceania: Soy is not mentioned at Australia, New Zealand, British New Guinea, former German New Guinea [later Papua New Guinea], or any other country in southern Oceania. (p. 297). Recapitulative tables–Imports and exports from 1910-1919. Soybeans, p. 368-69. Peanuts, p. 370-75. Sesame seeds, p. 376-79. Palm fruits (*Amandes de palme*, from which palm oil is obtained), p. 392-93. Peanut oil, p. 414-17. Corn oil, p. 416-17. Sesame oil, p. 418-19. Soy oil, p. 420-21. Other oils covered in detail by this book are: Cottonseed, hempseed, linseed, rapeseed (*colza* and *navette*), poppy (*pavot* or *oeilette*), castor, olive, coconut, palm, and other–non-specified. Address: 1. Doctor of Agronomics; 2. Doctor of Economics. Both: IIA, Rome, Italy.

314. *Argus (The) (Melbourne, Victoria, Australia).* 1921. Soya beans. Dec. 31. p. 8.

• ***Summary:*** "We have been slow in appreciating the value of the soya bean, which in its native habitat is made to fill many roles, not only in providing fodder for animals, but also as a foodstuff for the household. An article in 'The Australasian' points out the many uses to which the plant is put in China and in America, and it seems to demand much greater attention than it at present receives."

315. *Argus (The) (Melbourne, Victoria, Australia).* 1922. Food for the million. Jan. 7. p. 4.

• ***Summary:*** "A Hungarian scientist, Dr. Laszlo Berczeller, recently gave an account of experiments he has made with the soya bean. The nutritive value of this bean has been known for centuries. It comes into prominence to-day because from it can be made the cheapest and most sustaining food in the world. Great interest has been aroused in this Hungarian scientist's discovery. Greater interest, will probably be aroused when it is known that Dr. K. R. Shaw, of Harley street, London, has been working out the problems of the food value of the soya bean from the point of view of European consumption for many years.

"In an interview with a 'Morning Post' representative, Dr. Shaw told how he first came to be interested in the soya bean and of the experiments he had made to produce foodstuffs from it. 'I came across the soya bean in Mexico some 20 years ago,' said Dr. Shaw. 'I was interested in it because I found that when the natives went on long treks all they took with them were soya beans. These were sufficient for all their wants. I watched how they prepared the beans, and found that all they did was to roast them before eating them. I began to eat the beans myself, and found them both palatable and nourishing. On returning to England I began to collect all the information I could about the soya bean. As my information grew I found that the natives of the various countries, China, Japan, Mexico, were all content to eat the bean as it was after roasting it. It was clear that for Western palates this method would not do. I was also curious to know why they roasted the bean. This I found out by eating the bean raw. I discovered that it contained a large quantity of volatile oil which made it quite unfit for consumption in the raw state. Animals, as well as human beings, could not thrive on the bean until the oil had been taken away. After a number of experiments I discovered a new method for getting rid of the oil. It is simpler than roasting, and merely consists in treating the bean with a certain amount of alcohol. All the wonderful nutritive values of the bean are retained, and for some time now I have been able to produce foods from the bean in a variety of forms.

"'These foods are perfectly palatable to Europeans (which has never been the case hitherto with any soya bean product either for animals or human beings). They can be produced in the form of bread, biscuits, or vegetables at prices much below any of those prevailing to-day for the staple articles of diet. A person can live on the soya bean food and be adequately sustained for far longer than on any European food. Children thrive on it, and it is particularly efficacious in the case of those in any way affected by tuberculosis.

"'The possibilities of this new bean food are boundless, particularly at a time when foodstuffs are so dear and some of the peoples of Central Europe are starving. I am convinced that the food now to be made from the soya bean will do something, at any rate, to solve the Russian famine problem.'"

316. Wenholz, H. 1922. Summer leguminous crops: Cowpeas, soybeans, and velvet beans. *Agricultural Gazette of New South Wales* 33(5):323-31. May.
• ***Summary:*** "Soybeans grow fairly well on the coast, but for green manuring purposes cowpeas compete too strongly for them to make much headway. Good results have, however, been secured from soybeans in the cooler tableland districts, where velvet beans and cowpeas are out of the question on account of the warmth and moisture they require."

The section on "Soybeans" (p. 326-29) has the following contents: Introduction. The utility of soybeans. Planting. Varieties (Otootan, Hollybrook, Mammoth Yellow, Haberlandt). As hay or fodder crop.

"For many years soybeans were tried on the North Coast and in other warm districts on the western slopes, but without any sign of success. From this failure it has been wrongly concluded that the climate of New South Wales is wholly unsuited to the culture of soybeans." Address: B.Sc. (Agr.), Inspector of Agriculture.

317. Vesta. 1922. Women to women: Welfare of the young. *Argus (The) (Melbourne, Victoria, Australia).* Aug. 30. p. 4-5.
• ***Summary:*** The recipe for Worcestershire sauce (p. 5) calls for "1 pint of Indian soy sauce."

318. Briggs, Glenn. 1922. Leguminous crops for Guam. *Guam Agricultural Experiment Station, Island of Guam, Bulletin* No. 4. Aug. 29 p.
• ***Summary:*** Contents: Introduction. Uses of legumes: As a feed, as soil builders, as a cover crop, as catch crop, as a green manure crop, as a windbreak. Adaptation to Guam. Growing legumes. Harvesting. Storing seed. Feeding value. Selection of crop. Varieties. Legumes found on the island. Summary.

Soybeans are first mentioned in the section titled "Harvesting" (p. 8-9), which states: "A shelling percentage record was kept on a number of cover crops when harvested, with the following results: Cowpeas, 69.2 per cent... soy beans 60 per cent."

The section on "Selection of the crop" (p. 10) states: "... the Guam station has tested a number of legumes to determine their adaptability to Guam conditions. Those included in the observations were cowpeas, velvet beans, soy beans, pigeon peas, jack beans, mungo [mung] beans *(Phaseolus aureus* or *P. mungo),* alfalfa, Patani beans (chochomeco, *Phaseolus lunatus* sp...").

The section titled "Soy beans *(Glycine soja* or *Soja max)*" (p. 17-18) gives details on this new crop. "Soy beans have not been grown on the island for a length of time sufficient to warrant the drawing of definite conclusions regarding their adaptability. Judging from present indications, however, it is thought that they might become a valuable crop. Eight varieties of soy beans were planted in a variety test on May 22 (Plate VIII), and with the exception of the Biloxi variety (Plate IX, Fig. 1), which gave a good germination at the start, had to be replanted on June 5, 1920. The results of the test are shown in the following table: For each of the 8 varieties (Mammoth Yellow, Laredo, Hahto, Tokio, Haberlandt, Virginia, Biloxi, and Barchett [sic, Barchet]) it shows: Date of blossoming. Height of plants at harvest time. Date of first harvest. Yield of seed per acre. Remarks. Biloxi gave by far the largest yield (3,600 lb/acre), followed by Laredo (2,150), and Barchett (1,625).

A footnote states: "Since these results were obtained during extremely wet and unfavorable weather, it is thought that very much better results would be had in a favorable season." Photos show: (1) Pods and seeds of the 8 varieties. (2) Rows of Biloxi soy bean growing at Biloxi, Mississippi. Photo from the USDA Bureau of Plant Industry.

The summary (p. 28-29) states: "Soy beans and peanuts ["cacaguate"] give promise of becoming valuable leguminous crops." The summary and last chapter also mention adzuki beans, seguidilla *(Psophocarpus tetragonoloba [sic, tetragonolobus]),* and kudzu *(Pueraria thunbergiana).*

Note 1. This is the earliest document seen (March 2010) concerning soybeans in Guam, or the cultivation of soybeans in Guam. This document contains the earliest date seen for soybeans in Guam, or the cultivation of soybeans in Guam (22 May 1920). The source of these soybeans was probably the Bureau of Plant Industry, USA.

Note 2. Concerning a "catch crop" we read (p. 4) that it "is one that is grown as an intermediate between two crops in an ordinary rotation, or between the rows of another crop. The purpose of a catch crop is to utilize the land to its fullest extent. Leguminous crops make the best catch crop because they remove very little fertility from the soil, especially if the vines are returned to it." Address: Guam.

319. *Toronto Daily Star (Canada).* 1922. Food and fuel supplied by Eastern "magic bean": Oil and dozen other articles obtained from useful plant. Sept. 25. p. 4.
• ***Summary:*** "London, Aug. 14–The 'magic bean' has been discovered, according to the *Daily Mail* [a British newspaper].

"After eight years of effort to 'tame' the Soya bean–the natural home of which is in the Far East–Mr. J.L. North, curator of the Royal Botanic Gardens, Regent's Park, N.W. [London], has produced a variety which, it is claimed, is not only able to weather the very adverse climate of this country [England], but can be made to flourish."

Yesterday, Mr. North told a Daily Mail reporter that, upon request, he has sent seeds of his variety to many parts of the world. "'They are now being grown and tested in twenty-two countries in England, Scotland and Ireland, in the Channel Islands [in the English Channel, off the coast of Normandy; part of the UK], and in the Transvaal, Cape Colony [today's Republic of South Africa], Ecuador, Brazil, the United States, Canada, New Zealand, Tasmania, Queensland [Australia], Spain, Portugal, Austria and Syria."

About 20 acres of soya beans are now in luxuriant foliage in and around London. "Soya bean flour" can be made from soybeans after their oil is extracted.

Note 1. This is the earliest document seen (Dec. 2009) concerning the cultivation of soya beans in Ireland (the Irish Republic). These soybeans were actually first cultivated in 1923–See: *Eire Department of Agriculture Journal.* 1939. "The soya bean." 36(1):73-79. March.

Note 2. This is the earliest document seen (March 2010) concerning soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands. This document contains the earliest date seen for soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands (Sept. 1922). The source of these soybeans was Mr. J.L. North. The Channel Islands (incl. Jersey, Guernsey, Alderney, and Stark) are in the English Channel, just west of the northwest tip of France (Manche dept.). Part of the United Kingdom, they were once part of the ancient Dukedom of Normandy (France); today they are domestically independent, not controlled by the British government. The inhabitants are of part Norman descent (French), part English. Here the well-known Jersey and Guernsey breeds of cattle originated.

320. Brown, W.H. comp. 1922. The farmers' handbook. 4th ed. Sydney, NSW, Australia: New South Wales Dept. of Agriculture. vi + 966 p. See p. 565-67. Illust. 24 cm. 1st ed. was 1911. 3rd ed. was 1918. 5th ed. was 1943.
• ***Summary:*** Section 7, "Leguminous crops (p. 532-89), has the following contents: Introduction: Soil inoculation, summer crops (incl. soybeans), winter legumes. Lucerne [alfalfa] (now the chief leguminous crop of NSW). Cowpeas. Soy beans. Velvet beans. Peanuts. Field peas. Vetches and tares. Clovers (the 3 basic types are annual, biennial, and perennial, and there are several varieties of each, in the genera *Trifolium* and *Medicago).* Medics (incl. Burr medics, Spineless medics), trefoils *(Medicago lupulina* [English trefoil]), and crowfoots *(Erodium* sp.).

The subsection on soybeans (p. 565-67) states: "Introduction: A crop which is grown to the extent of 190,000 acres in the United States seems surely to merit some place in the agriculture of New South Wales, which in many parts is climatically similar to America.

"For many years soybeans were tried on the North Coast and in other warm districts on the western slopes, but without any sign of success. From this failure it has been wrongly concluded that the climate of New South Wales is wholly unsuited to the culture of soybeans. Evidence is now available to the effect that it is in the cooler climates of the State chiefly that soybeans will be generally most successful. On the North Coast, both velvet beans and cowpeas are too strong competitors as green manures or even as fodder crops, with perhaps the exception of one outstanding variety of soybeans. Though resistant to a certain amount of dry weather, soybeans are not sufficiently drought-resistant to stand the long dry spells experienced during the summer in the western districts, except in favoured localities on the slopes.

"Although killed by heavy frost, soybeans will stand a considerable amount of frost without injury, and have already been successfully grown on parts of the Northern, Central, and Southern Tablelands."

"The utility of soybeans: The soybean is one of the most important crops of China and Japan, and from these countries a large amount of soybean oil is exported, some of which finds its way into Australia." The semi-drying oil is used chiefly in the manufacture of paint and soap.

"It is not, however, as a grain crop for this purpose that it is likely to make headway here. Apart from its value as green manure (being a legume, it maintains or increases the nitrogen of the soil also), the soybean excels mainly–(1) as a grain crop for hogging down, on account of its heavy production of seed of very high protein and oil content and excellent feeding value, and (2) as an emergency hay crop on account of the high value of its fodder... the hay is about equal in feeding value to lucerne hay, and superior to clover hay, and it has the added virtue of being able to produce good crops of hay on soils too poor or too sour for clover or lucerne.

"Unlike cowpeas, the soybean ripens all its seed at about the same time; on the tablelands, the best varieties take about four months to reach the hay or fodder stage, and about 5 months to mature seed."

The soybean is comparatively free from attacks of insects and diseases. Even the seed in storage is not affected by the bean weevil which infests cowpeas and other beans so badly. Rabbits are, however, very partial to the crop, even when plenty of other feed is available..."

Planting: The best time to soy soybeans is a little after maize has been planted. "Soybean seed heats very quickly in storage (especially in a warm, moist climate) and also loses its germinating power very quickly if kept for any length of time, especially over one season.

Varieties: "Of the varieties tried so far in New South Wales, the following seem to do best:" Otootan, Hollybrook, Mammoth Yellow, Haberlandt.

As a hay or fodder crop: "It is as an emergency hay crop that soybeans are destined to fill a place in our tableland agriculture." The soybean's five chief qualities are described. Address: Editor of Publications, New South Wales Dep. of Agriculture, Sydney, Australia.

321. Piper, Charles V.; Morse, William J. 1923. The soybean. New York, NY: McGraw-Hill Book Company, Inc. xv + 329 p. Feb. Illust. Index. 24 cm. Reprinted unrevised in 1943 by Peter Smith Publishers, New York. [563 ref]
• ***Summary:*** This is the first comprehensive book about the soybean written in English, and the most important book on soybeans and soyfoods written in its time. Contains an excellent review of the world literature on soybeans und soyfoods with a bibliography on soy that is larger than any published prior to that time (563 references), a good description of the present status of the soybean worldwide based on the authors' extensive contacts, and a great deal of original information. It quickly became a key source for people and organizations working with soybeans and soyfoods in all countries, and a major factor in the expansion of the soybean in the western world. Because of its scope and influence, Soyfoods Center considers the year of its publication to mark the end of the "Early Years" of the soybean worldwide. It remained in print until about 1986.

Contents: Preface. 1. Introduction: Name of the plant, origin, literature, use by the Chinese and Japanese, present importance, future prospects in the U.S., recognition of the possibilities. 2. The commercial status of the soybean: Manchuria and China, Japan, Europe, U.S., other countries, summary of imports and exports of soybeans and soybean oil. 3. Botanical history of the soybean: History prior to Linnaeus' "Species Plantarum" 1753, Linnaeus' misunderstandings of the soybean, Prain's elucidation, other and the correct botanical name.

4. Agricultural history of the soybean: Vernacular names of the soybean, China, Korea, and Japan, India and neighboring regions, Cochin China, Malayan region, early introduction into the United States, later U.S. introductions, the early introduced varieties (grown in the USA by 1898–Ito San, Mammoth, Buckshot, Guelph or Medium Green, Butterball, Kingston, Samarow, Eda, Ogemaw or Ogema), soybean in Europe, varieties grown in Europe and identification, Hawaiian Islands, Australia, Africa, Argentina (p. 50), Canada ("Soybeans are grown in very small quantities in Canada and then usually as a forage crop"), Philippines, Egypt, Cuba (p. 52), British Guiana, Mauritius (p. 53), present culture distribution. 5. Culture of the soybean: Climatic adaptations, soil preferences, water requirement, preparation of seed bed, time of planting, methods and rate of seeding, seeding for pasturage, depth of seeding, inoculation, fertilizer reactions, cultivation, soybeans in mixtures (with cowpeas, sorghums, Sudan grass, Johnson grass, millet, corn, or sunflowers and corn).

6. Harvesting and storage of soybeans: harvesting soybeans for hay, silage, for the seed, seed yields, proportion of straw to seed, storing seed, separation of cracked from whole soybean seed, viability of soybean seed, pedigreed, inspected, registered, and certified seed. 7. Composition of the soybean: Proportions of stems, leaves and pods, composition of plant and seed, nutritive and mineral constituents, forms of nitrogen in soybean nodules, factors affecting oil content of seed. 8. Utilization of the soybean: Diversity of uses (a chart, p. 129, shows 59 products that can be made from soybean seeds, and 6 more that can be made from soybean plants), soybeans for green manure, pasturage, soiling, ensilage, hay, straw.

9. Varieties: Japanese, Manchurian, botanical classifications, vital characteristics, descriptions of important varieties, key for identification, breeding and improvement, genetic behavior, oil content.

10. Structure of soybean seeds. 11. Soybean oil: Methods of extraction [Manchurian, and solvent], American oil mills, methods of shipping and marketing, prices, utilization in soap manufacture, food, paint manufacture, miscellaneous. 12. Soybean cake or meal: Feeding value, composition, use for feeding for dairy cows, cattle, swine, sheep, poultry, digestibility, injurious effects, fertilizer.

13. Soybean products for human food: Food value of the soybean, digestibility of the soybean and its products, mature or dry soybeans, immature or green soybeans (a "nutritious green vegetable"), soybean flour, digestibility of soybean flour, soybean bran (p. 225-26), soybean sprouts, soybean coffee, soybean or vegetable milk [soymilk] (preparation, composition, residue from the manufacture of vegetable milk [okara], utilization of soybean milk, condensed vegetable milk, vegetable milk powder, fermented vegetable milk), vegetable casein, tofu or soybean curd (names and brief history, method of manufacture, coagulating agents, manufacturing yields, digestibility, utilization of bean curd and manufactured products, bean curd brains or *tofu nao,* dry bean curd or *tofu khan,* thousand folds *[chien chang tofu],* fried bean curd *[tza tofu],* Fragrant dry bean curd *[hsiang khan],* frozen tofu *[kori tofu],* Chinese preparation, various dishes), natto, hamananatto [hamanatto], yuba, miso, shoyu [soy sauce], confections. 14. Table dishes of soybeans and soybean products: mature or dry beans, flour, tofu, sprouts (86 recipes). 15. Enemies of the soybean: bacterial, mosaic, fungous [fungus], and nematode diseases, insects, rodents. This last chapter is a comprehensive review of the literature on soybean diseases and insects published before 1922.

The Preface begins: "The soybean, also known as soya or soja bean, has assumed great importance in recent years and offers far-reaching possibilities of the future, particularly in the United States. It is, therefore, desirable to bring together in a single volume the accumulated information concerning this crop...

"The aim has been to present the information so as to make it useful from both agricultural and commercial standpoints, not omitting, however, much that is mainly of historical or botanical interest..."

The introduction begins: "There is a wide and growing belief that the soybean is destined to become one of the leading farm crops in the United States."

Note 1. C.V. Piper lived 1867-1926. Note 2. This is the earliest English-language document seen (July 2003) that uses the term "soybean bran" to refer to soy bran.

Note 3. This is the earliest document seen in which Piper or Morse describe natto, Hamananatto [Hamanatto], yuba, or miso.

Note 4. This book was published by March 1923 (See *Ohio Farmer,* 10 March 1923, p. 313). Address: 1. Agrostologist; 2. Agronomist. Both: United States Dep. of Agriculture, Washington, DC.

322. Piper, Charles V.; Morse, William J. 1923. Soybeans in Australia (Document part). In: Piper and Morse. 1923. The Soybean. New York: McGraw-Hill. xv + 329 p. See p. 49, 51.

• ***Summary:*** "Numerous experimental trials with the soybean have been made, in Victoria, Queensland and New South Wales. The crop has not given promising results in New South Wales but success resulted in Victoria and Queensland for both seed and forage."

A map (p. 51) shows that soybeans are grown mostly in the eastern one-third of Australia. See also p. 23.

323. Kikkoman. 1923-1954. [Monthly and annual soy sauce exports from Japan (1923-54)]. Noda: Kikkoman. Statistical tables. 22 p. [Jap; eng+]

• ***Summary:*** In 1923, some 11,720 *koku* of shoyu [soy sauce], worth 799,022 yen, were exported from Japan. (Note: 1 koku = 180 liters or 47.6 gallons). Of this, 5,307 koku went to the USA and Hawaii (3,330 koku to the USA), 709 koku to Canada, 5,108 koku to Asia (incl. 2,311 koku to Canton and 1,447 koku to China), and 201 koku to Europe. In 1924 total exports increased to 13,149 koku.

A table shows Kikkoman's exports of shoyu by country from 1938 to 1944. In 1938 Kikkoman exported 80 tonnes (metric tons) of shoyu to Peru and Argentina. In 1939, the peak year, 10,658 tonnes were exported; of this 4,444 tonnes (41.7% of the total) went to the USA and Hawaii, 2,680 tonnes went to Manchuria, and 2,098 tonnes to China.

Another table shows total Japanese exports of shoyu by country from 1938 to 1944. In 1939, the peak year, 34,838 tonnes (metric tons) were exported; of this 4,351 tonnes (12% of the total) went to the USA and Hawaii, 293 tonnes went to Canada, 50 tonnes to South America (Peru and Argentina), 63 tonnes to Europe (Holland), and 30,081 tonnes to Asia (incl. 9,550 tonnes to Karafuto, 5,803 tonnes to Taiwan, 4,620 tonnes to Manchuria, 4,295 tonnes to China, and 1,336 tonnes to the Philippines).

Another table shows exports of shoyu from Japan after World War II (1949-1954) to various countries and regions by Kikkoman and by all Japanese shoyu makers. Roughly 85% of Japan's exports were by Kikkoman. The total increased from 6,066 koku in 1949 to 9,316 koku in 1954; of the 1954 figure, 7,009 koku went to the USA and 1,476 koku to Asia. Another table shows exports of shoyu from Japan to major cities from 1949 to 1954 by Kikkoman and by all of Japan. In 1954, worldwide, the cities receiving the most shoyu were: San Francisco 2,033 koku, Honolulu 1,926 koku, Los Angeles 1,504 koku, Okinawa 1,376 koku, Guam 647 koku, Vancouver (BC, Canada) 414 koku, New

York 381 koku, Seattle (Washington state) 290 koku. Address: Noda, Japan.

324. Campbell, Persia Crawford. 1923. Chinese coolie emigration to countries within the British Empire. London: P.S. King & Son, Ltd. xxiii + 240 p. Preface by the Hon. W. Pember Reeves. 22 cm.

• ***Summary:*** Discusses the background of the terrible coolie trade and the use of indentured coolie servants and the credit-ticket system. It was largely a veiled slave trade, and the traffic was greatest from 1845 to 1877. Most of the migration was from Kwangtung province in southern China, an area gripped by famine, feud, and economic hardship. The coolie trade was active in different countries at different times: British Malaysia (1877-1916), the USA (1850-1882), British Columbia, Canada (1880s), Australia (1855-1888), Cuba (1870s), British West Indies (1852-1860s), Transvaal, South Africa (1904-1909).

Note: Though soybeans are not discussed in this book, some of these Chinese may have taken soybeans with them to foreign countries.

The author was born in 1898. This is No. 72 in a series of monographs titled "Studies in Economics and Political Science" by writers connected with the London School of Economics and Political Science. Address: British Fellow Bryn Mawr College, Bryn Mawr, Pennsylvania.

325. Capone, Giorgio; Grinenco, Ivan; Costa, Mario. eds. 1923. Oleaginous products and vegetable oils: Production and trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. XX-XXI, 140-41, 144-47, 442-43, 480-81. No index. 24 cm. [Eng]

• ***Summary:*** In Sept. 1921 the IIA published a monograph on this subject in French. By popular demand, this English edition was published 2 years later. Contents: Introduction (p. VII-XXXII): General scope, general survey of the 9 principal crops (including soya beans) plus others, final points of consideration. Part I (p. 1-402) is an analysis by region, and within each region by country, countries of vegetable oil production and trade. Regions are Europe, North and Central America, South America, Asia, Africa, and Oceania.

Major countries: Denmark (p. 20-23; oil production 1916-1921, oil imports 1910-1922). France (p. 26-34). Germany (p. 35-40). Great Britain and Ireland (p. 41-43). Netherlands (p. 65-68). Norway (p. 69-70). Russia–European and Asiatic (p. 84-93). Sweden (p. 100-03). Canada (p. 111-15). United States (p. 131-47). Argentina (p. 179-85; no soy). Brazil (p. 187-90; no soy). Ceylon (p. 218-21; no soy). China (p. 222-26). Dutch East Indies (Java & Madura, Other islands; p. 229-33). Formosa (p. 238-39; gives soybean production and acreage from 1900 to 1921). Japan (p. 259-64; gives Japanese soybean production and acreage from 1877 to 1921, and production of soya oil from 1909 to 1920. Japan's leading oil produced domestically from 1895 was rapeseed oil). Korea (Chosen, p. 265-67). Kwantung Leased Territory (p. 268). Hawaii (p. 388; Hawaii produced 17 long tons of soybeans on 20 acres in 1909, and 10 tons on 15 acres in 1919).

Part II (p. 403-506) is recapitulatory tables for both soya beans and soya bean oil: Area and production by crop (1909-1922), Trade by crop (1909-1921). Cottonseed (p. 410-11). Linseed (p. 414-15). Soya beans (p. 442-43, 480-81).

Pages XX-XXI state: "In the absence of data from China, the chief grower of soya beans, it is impossible to make even the roughest estimate of the world's yield of this product. Among the few countries of any moment as producers of soya beans, we may mention: Japan, where this crop increased rapidly between 1877 and 1887 and then became nearly stationary at about 500,000 long tons [2,240 lb per long ton] per annum, although in the last few years some further increase has been noticeable; Korea, with a continuous increase in area and yield, from 1910 onwards, (the crop of 1920 was about 600,000 long tons); and United States, where from 1909 to 1921, the area under soya beans increased from about 1,600 to 186,000 acres with a production of about 70 thousand long tons. It may be observed that the increase of this crop during the last twenty years is supplemented by attempts already made and in progress for its introduction into countries with a favourable climate, especially into Africa."

"Exports are exclusively from China and Korea. The Chinese exports have increased very greatly during the last thirty years. Before 1890 they were insignificant, in 1901 they had reached a total of more than 100 thousand tons, and during the decade from 1909 to 1918 they averaged about 600 thousand tons and reached their maximum in 1919 with about 1 million, declining in the two following years to 600 thousand long tons.

"With regard to Korea although we have not a complete series of data for the period 1909-1918, the ever-increasing importance of its exports of soya beans may be emphasized; during the last few years these have been double the average of the years 1909-1911, and in 1921 they already equalled one third of the Chinese exports."

"The chief importers, in Europe are Great Britain, Denmark, and Holland, and, in Asia, Japan, and the Dutch East Indies. To these must also be added Russia-in-Asia as the Chinese Customs register large exports destined for the Russian Pacific ports."

"England, which at one time constituted the greatest market for the soya bean, has continually reduced its imports: these were 420 thousand long tons in 1910, 76 thousand in 1913, and about 60 thousand in the two years 1921-1922... In the Asiatic market, represented in this case by Japan and the Dutch East Indies, imports have continuously increased especially in the last few years of the period under consideration.

"The trade figures of *soya oil* (see tables on pages 480 and 481) indicate that China is the principal exporter, having quadrupled its shipment during the period from 1914 to 1919, attaining in the latter year a total of over 140 thousand long tons."

Other countries unrelated to soy (some no longer in existence): Europe: Esthonia [Estonia], Luxemburg [Luxembourg], Serb-Croat-Slovene State. North and Central America: British Honduras [named Belize after about 1975]. South America: Curaçao [Curacao], Falkland Islands, British Guiana, French Guiana. Asia: Aden [became part of independent Yemen in 1967], Andaman and Nicobar Islands, Bahrein Islands [Bahrain], Borneo (British Protectorates), Dutch East Indies, Federated Malay States, Formosa, French Settlements in India, Indo-China, Persia, Portuguese India [annexed in 1962 by India; became Union territory of Goa, Daman, and Diu], Protected Malay States, Russia, Japanese Saghalin (Karafuto), Siam [later Thailand], Straits Settlements [later Singapore], Timor and Cambing, Wei-Hai-Wei [Weihai, Wei-hai, or Weihaiwei; seaport in northeast Shandong province, northeast China]. Oceania: Australia, Fiji Islands, French Settlements in Oceania, Gilbert and Ellice Islands, Hawaii, Island of Guam, New Caledonia, New Hebrides, Papua, Samoan Islands (American Samoa), Solomon Islands, Territory of New Guinea *(Later German New Guinea)*, Tonga, Western Samoa *(Formerly German Samoa)*.

Note: This document gives a clear definition of the geographical region named "Oceania." A "quintal" is probably 100 kg. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

326. Capone, Giorgio; Grinenco, Ivan. 1923. Oceania (Document part). In: G. Capone & I. Grinenco, eds. 1923. Oleaginous Products and Vegetable Oils: Production and Trade. Rome, Italy: International Institute of Agriculture, Bureau of Statistics. 545 p. See p. 379-402. [Eng]

• ***Summary:*** Australia (p. 381-83). Table 1 shows cultivated area and production from 1903-1923; both were very small. In 1903-06 the leader in production was linseed (73 long tons; 1 long ton = 2,240 lb), followed by cotton (15 tons). Statistics for sunflower seeds were first given in 1910, and groundnuts in 1911. During the 1920s the main oilseed by far was cottonseed. A table of imports of oleaginous products and vegetable oils shows that the main oleaginous product imported was always copra (38,896 long tons in 1920-21); in 1920-21 it was followed by linseed and coconuts. The main vegetable oils imported in 1920-21 were linseed (1,619 tons) and rapeseed (522 tons).

Fiji Islands (p. 384-85): They grew mostly coconuts and small areas of cotton, and exported significant amounts of copra.

French Settlements in Oceania (p. 386) grew mostly coconuts on the Pacific islands and Marquesas Islands. Large amounts of coconuts and copra were exported.

Gilbert and Ellice Islands (p. 387) grew coconuts and exported copra. Note: The Gilbert and Ellice Islands Colony was a former British colony in the western Pacific Ocean consisting of the Gilbert Islands, Ellice Islands, Ocean Island, and three islands (Fanning, Washington, and Christmas) of the Line Islands, and the Phoenix Islands. Area: 238 square miles. Capital: Tarawa (later capital of Kiribati). 1978 population: About 56,213. Brief history: 1892–The two main groups were proclaimed a British protectorate. 1915–Made a colony. 1916–Fanning Island, Washington Island, and Ocean Island added. 1919-Christmas Island added. 1937–Phoenix group added. 1971–New constitution inaugurated. 1976–Divided between Gilbert Islands and Ellice Islands. -

Hawaii (p. 388): Table 1 shows area and production of oil-yielding crops compiled by the Bureau of the Census in 1909 and 1919. Concerning area in 1909, Hawaii had 32,777 coco palms in bearing, plus 37 acres of cotton, 20 acres of soya, and 20 acres of groundnuts. In 1919, Hawaii had only 7,197 coco palms in bearing, plus 14 acres of cotton, 15 acres of soya, and 275 acres of groundnuts.

Concerning production, in 1909 Hawaii produced 136,827 coconuts plus 17 long tons of soya (1 long ton = 2,240 lb), 16 tons of groundnuts, and 5 tons of cottonseed. In 1919 Hawaii produced 161,123 coconuts plus 10 tons of soya, 55 tons of groundnuts, and 10 tons of cottonseed.

Island of Guam (p. 389) grew coconuts. New Caledonia (p. 390-91) grew cotton, coconuts, and olives. Exports of copra are given from 1896-1919. The main import and the main export is copra.

New Herbrides (p. 392-93) grew mostly coconuts, followed by cottonseed, and exported copra.

New Zealand (p. 394-95) keeps statistics on only one oilseed, linseed. Production grew from 53 long tons in 1903 to 4,552 tons in 1920-21. The main imports of oleaginous products are whole coconuts and copra, and of vegetable oils are linseed oil, plus small amounts of castor oil.

Papua (p. 396). The main crop produced is coconuts, followed by small amounts of cotton. The main export is copra.

Samoan Islands (American Samoa–p. 398): The chief crop is coconut, which provides the only article of export in the form of copra. Solomon Islands (p. 398): The principal industry is copra. A table shows exports of coconut and copra from 1910 to 1922. Territory of New Guinea (Later German New Guinea–p. 399): One table shows the total area under coconuts from 1909 to 1922. A second shows exports of copra from 1912 to 1922.

Tonga (p. 400): Copra is the main industry of this group of islands. A table shows exports of copra from 1909 to 1919. Western Samoa (Formerly German Samoa–p. 401):

The main crop of these islands is coconuts, and copra is the main export. Address: 1. Doctor of Economics; 2. Doctor of Agronomics. Both: IIA, Rome, Italy.

327. Field Naturalists' Club of Victoria. Plant Names Committee. 1923. A census of the plants of Victoria, with their regional distribution and the vernacular names... Melbourne, Australia: Field Naturalists' Club of Victoria. xvi + 93 p. 20 cm. [2 soy ref]

• ***Summary:*** In Aug. 1907 the Field Naturalists' Club of Victoria appointed a Plant Names Committee to select and adopt those names considered most suitable for the better known endemic plants. In a long 3-column table under Glycine we read (p. 37): *Glycine clandestina,* Wendl., 221 (= p. 221 in Mueller's "Key")–Twining Glycine–All (k., f., s.).

G. Latrobeana, Bth. [Bentham], 221–Purple–S.W., S. (k., f.), E.

G. tabacina, Bth., 221–Variable–N.W., S. (k., N.E.).

G. serica, Bth., 221–Silky–N.W., v. rare.

Note: In column 3: "All" means that the species is widespread throughout the State (Victoria). Letters mean that the plant has been found within 30 miles of Melbourne. k. = in the grassland of the Keilor or basalt plains. f. = in the forest country of the Silurian formation. s. = in the dwarf scrub of the Sandringham red sandy area.

Maps show: (1) The Melbourne District (p. xi). (2) Victoria, with Mueller's geographical divisions. Address: Victoria, Australia.

328. Lewis, William S.; Murakami, Naojiro. eds. 1923. Ranald MacDonald: The narrative of his early life on the Columbia under the Hudson's Bay Company's regime; of his experiences in the Pacific Whale Fishery; and of his great adventure to Japan; with a sketch of his later life on the western frontier, 1824-1894. Spokane, Washington: Published for The Eastern Washington State Historical Society by The Inland-American Printing Co. 336 p. 25 cm. [127* ref]

• ***Summary:*** Ranald MacDonald was born on 3 Feb. 1824 at Fort George, a great trading post located at the mouth of the Columbia River, owned by the Hudson's Bay Company, and formerly called Astoria; this area is now in Oregon. His mother was an Indian (he believed that she was a daughter of the great Chinook Chief Com-comly) and his father, Archibald, was a Scotch highlander; he was born a British subject. His mother died a few months after his birth and he was raised by his mother's sister. In Sept. 1825 his father remarried and he was raised by a stepmother, Jane Klyne. He worked with the Hudson's Bay Company, of which his father was chief trader and chief factor. The Oregon Treaty of 1845 made him a citizen of the United States.

"In March 1833 a Japanese junk laden with crockery..., blown across the Pacific, was wrecked about 15 miles south of Cape Flattery [on the northwest coast of Washington] and all of the seventeen men on board lost except three who were seized and held as slaves by the local Indians... These Japanese were subsequently rescued from the Indians in May, 1834, by Captain William McNeil–the Boston skipper–on board the Hudson's Bay Company ship 'Llama' and taken to Fort Vancouver." Numerous primary sources for this information published in the 1830s are cited. The kind Dr. John McLoughlin attempted to return these shipwrecked Japanese to Japan via London (England), and Macao, China–but Japan would not accept them. These were apparently the first Japanese in the U.S.A. and the incident inspired MacDonald to travel to Japan to learn more about the Japanese. At age 24, in July 1848, he arrived in the Japan Sea on the American whale ship 'Plymouth' under captain Edwards. He then left the whale ship alone in a small boat. After going ashore on 3 small islands (Teure, Yankeshiri, Rishiri) inhabited by Ainu off the coast of Yesso (Yeso, now called Hokkaido), he landed at Soya on the northernmost tip of Hokkaido. Then, treated as a prisoner, he was sent on the ship Tenjinmaru to Nagasaki and saw the small island of "Dessima" (Deshima, Dejima) in the harbor. He was confined to a sort of prison which he was never allowed to leave and made to wait about 7 months until the next Dutch ship arrived. During this time he taught English to various eager pupils and interpreters. He was the first English instructor in Japan. His best student was the brilliant Yeanosuke Murayama, who was already fluent in Dutch. He stayed in Japan until 26 April 1849 when he was removed on the American ship 'Preble' under commander James Glynn.

While in Japan MacDonald compiled a glossary or dictionary of about 550 Japanese words and their English equivalents. Among these were tofu (he wrote "tove"; see p. 288), and shoyu [soy sauce] (he wrote "shon" or "son"; see p. 297). After further travels to China, India, Australia and Europe, he returned to America in 1853 to live his later years in his native homeland near the Columbia River, in the Pacific Northwest.

Note: This book is extremely well written and carefully documented, with extensive scholarly footnotes. There are numerous appendixes, a glossary, and two bibliographies. One of the appendixes (II-C, p. 280-84) is a deposition taken by commander Glynn on 30 April 1849; it tells of MacDonald's life and the story of his stay in Japan up to that time. It appears in U.S. Senate, Executive Docket, 32nd congress, 1st session, No. 59, p. 25-28.

An illustration (p. 208) shows Maruyama and Tokojiro, two Japanese men in Edo period dress. Both pupils of Ranald MacDonald, they were the chief interpreters in negotiations with Commodore Perry.

Footnote 238 (p. 209) states: "During the period of exclusion, Occidental knowledge of Japan was derived through the Dutch. Three physicians attached to the Dutch factory at Nagasaki contributed principally to this knowledge of Japan: Englebrecht [Englebert] Kaempfer (Japan 1690-1692), author of a *"History of Japan and Siam,"* London, 1727; Charles Peter Thunberg (Japan, 1775-1776), author of *Travels in Europe, Africa and Asia;* and Philip [sic, Philipp] Franz von Siebold (Japan 1822-1830), author of *Nippon, an Archive towards the description of Japan.* In addition to these, three directors of the Nagasaki factory, Isaac Titsingh, J. F. van Overmeer Fisscher and G. F. Meijan, furnished further information. Additional information was received through Russian sources from the published account of Georg Heinrich von Langsdorff, a German physician attached to the Reasanoff expedition (1804), and from Captain Vasili M. Golownin's *Memoirs of His Captivity in Japan, 1811-1813.*

"In like manner whatever Japan received of the material civilization of the Occident during these years was obtained principally through the Dutch." Address: 2. Head, School of Music, Imperial Univ., Tokyo. Formerly head of the Dep. of Foreign Languages at the Imperial Univ.

329. *NZ Truth (National, New Zealand).*1924. Answers to correspondents. Dec. 6. p. 14.
• ***Summary:*** "A highly recommended recipe for home-made Worcester Sauce is the following: 1 pint Indian soy [sauce]; 1 oz black pepper; 1 oz powdered mace,..."

330. Lady Mary. 1924. The ladies chain: Facts & fiction for femininity. *NZ Truth (National, New Zealand).* Dec. 13. p. 15.
• ***Summary:*** A reader in New Zealand writes: "In several works of fiction I have read recently, reference is made to people consuming 'chop suey,' which is apparently a favorite Chinese dish." She then requests a recipe.

Lady Mary gives a recipe she found in an American publication. The ingredients include "2½ tablespoons of soy sauce."

331. Denison, C.A. 1924. Re: Use of combine to harvest soybeans. Letter to Mr. W.J. Morse, c/o Department of Agriculture, Washington, DC, Dec. 19. 2 p. Typed, with signature on letterhead.
• ***Summary:*** "In talking with Mr. John Smith at Tolono, Champaign County, Illinois, regarding the culture and harvesting of soy beans, he referred to you as being interested in the subject and would, no doubt, be in position to supply us with some information.

"Our recollection is that Mr. Smith spoke of telling you about the Massey-Harris Combined Reaper-Thresher being operated successfully in harvesting soy beans on the farm of Garwood Bros., Stonington, Illinois, this year.

"We enclose a descriptive folder of this machine [which is missing]. It cuts a swath of 12-ft. harvesting and threshing the beans with one operation. It is capable of handling about 25 acres per day and is operated with four men. One on the Tractor, one on the Reaper-Thresher and two men to haul the beans to the granary. This enables the farmer to handle the crop much more economical [sic] and speedily than heretofore and is looked upon as the solution of the harvesting and threshing of the soy bean crop.

"Our figures at Stonington indicate that this crop can be harvested and threshed and placed in the granary for an actual current expense of about 5 cents per bushel and taking into consideration the over-head expense of depreciation, a total of about 8 cents per bushel, whereas it has been costing the farmer from 25 to 30 cents per bushel.

"It is also a saving of seed and we attach a copy of a testimonial letter from Garwood Bros. [which is included and cited separately; dated 17 Nov. 1924], indicating their satisfaction. Our opinion is that this will, within the next two or three years, become in general use throughout the soy bean growing locality, and will have a tendency to promote an increased acreage.

"We now have a satisfactory machine for this work. It is our regular stock machine that has been built for years having been sold in the grain sections of South America, Australia and the Central West of this country. For soy beans we supply additional sieves and reduce the speed. These are the only changes.

"We are, in order to place the matter before the growers intelligently, interested in some information as to the amount of soy bean meal or cake and oil imported into this country and as to it's [sic] general uses.

"Mr. Smith suggested that you would, in his opinion, be interested to the extent of being able to furnish us with such information as we would require in endeavoring to place the matter before the growers in an intelligent way so that they would realize the magnitude of the enterprise.

"Any interest you might take in this will be appreciated and we thank you in advance. Yours truly."

Note: The letterhead shows that the company's head office and factory are at Batavia, New York.

Location: National Archives, College Park, Maryland. Record group 54–Bureau of Plant Industry, Soils and Agricultural Engineering. Subgroup–Div. of Forage Crops and Diseases. Series–General Correspondence, 1905-1929. Box 87–Martin-Means. Folder–Massey Harris Harvester Co., Inc. Address: Manager, Massey-Harris Harvester Co., Inc., Branch Office at St. Louis, Missouri.

332. Ito, Taro. 1925. The soya bean in Manchuria. *Far Eastern Review (Shanghai)* 21:236-37. May. [Eng]
• ***Summary:*** Contents: Production and trade of soya beans in Manchuria. Statistics on soya beans carried by the South Manchuria Railway (SMR), and export tonnage. Mixed storage system now in operation on railroads; adopted in 1919. Examination and grading of soya beans by examiners

appointed by the SMR. Details of grading. Method of packing and storing; projected elevator system.

China now produces about 80% of the world's soya beans, and 70% of China's output is grown in Manchuria. Manchuria is therefore the world's leading producer of soya beans, with annual production estimated at 3,500,000 kilolitres. Note: 1 kilolitre = 1,000 litres.

In 1923 the South Manchuria Railway (SMR) carried 2,000,000 metric tons of soya beans. "Of this tonnage, 400,000 tons were exported to Japan, 150,000 tons to China proper, 80,000 tons to the South Sea Islands and Australia and 1,000 tons to America, chiefly to the port of Seattle [Washington] in the Pacific area, and 120,000 tons to Europe and Africa." These exports, which total 751,000 tons, amount to about 37% of the soya beans carried by the SMR; they were shipped by steamers from Dairen, the southern terminal of the railroad.

But what happened to the remaining 63%, or 1,250,000 metric tons carried? "They were consumed in oil factories called by the Manchurians *Yu-Fang*, factories which flourish in Dairen and Yingkou for the manufacture of oil and cakes." In 1923 about 140,000 metric tons of [soya bean] oil and 1,300,000 tons of bean cake were exported. The oil went mainly to Europe and America, and the cake to Japan for use as fertilizer.

The examination and grading of soya beans "is ordinarily carried on in the railroad yards by drawing a certain number of samples from one consignment which comprises 350 bags, each bag weighing not less than about 85.2 kg. (142 kins). The method now in use is practical, based upon the appearance of the beans to the naked eye and their moisture content as estimated by chewing between the teeth. The authorities have under consideration the introduction of a more scientific method by which all the complaints arising from the examination and grading will be eliminated.

"The standards are fixed at a certain time of the year annually by experts in agriculture at the agricultural experimental station of the company, who collect beans from different parts of Manchuria and take into consideration many conditions necessary to the standardization. The standards now in operation have three grades, A.B.C. Beans which come below C are not to be accepted as freight under the mixed storage system... Bags used as containers of soya beans are gunny-bags, mostly imported from India–needless to say, some are imported from Japan. The annual import reaches 20 million bags on the average, comprising, of course, old ones as well as new.

"The bags in which beans are packed are examined and graded together with the beans. The standards thereof are also three."

The SMR's "mixed storage system" has resulted in improvement of quality and facilitated the sale of beans.

Photos show: (1) South Manchuria Railway's experimental bean mill. (2) Mukden railway station. (3) Acres of bean cake stored in the open on Dairen wharves. (4) Small part of Dairen wharves showing warehouses and open storage. Address: Manchuria Railways Co., Manchuria.

333. *Northern Territory Times and Gazette (Darwin, NT, Australia).* 1925. Northern Territory Representation League: Objects and platform. Oct. 20. p. 3.
• ***Summary:*** "14. The establishing of an Institute of Tropical research in Darwin, fully equipped for the studying of tropical diseases and parasites, and the development of tropical agriculture..."

"15. The Institute to give special attention to the practical and economical cultivation of such tropical produce as cotton, copra, peanuts, tobacco, rice, millet, the soya bean, citrus and other fruits,..."

334. Wilson (R.G.) and Co. Pty. Ltd. 1925. The best house for groceries (Ad). *Argus (The) (Melbourne, Victoria, Australia).* Nov. 4. p. 8.
• ***Summary:*** "Dried yeast: To convenience people we import regularly stocks of Royal Yeast Cakes, 5 tablets in a packet." Note: These are probably use for baking, typically bread, muffins, etc. at home.

Seasonable goods: Biscuits, Lindebooms,... Tabasco Sauce, 2/3 [2 shillings 3 pence]; India Soy, 1/6; China Soy, 1/6;...

"These can be suitably packed and sent to any part. If desired we can prepay all charges. Postal maximum is 11 lb. gross."

Note: This is the most recent of 283 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "China Soy." Address: 56-58 Elizabeth Street (East Side) [Melbourne]. Phone: Cent. 612, 613, 11003.

335. Wenholz, H. 1926. Soil fertility: Its maintenance and improvement by means of rotation, cover, and green manure crops. *Agricultural Gazette of New South Wales* 37(1):27-36. Jan.
• ***Summary:*** Contents: Introduction. Benefits of green manuring. Importance of nitrogen. Economy and utilisation of soil-improving crops. Types of green manure or cover crops (4 groups).

Group 1 is the annual summer legumes (incl. soybeans, cowpeas, pigeon peas, velvet beans). Group 2 is similar to group 1, except for late-maturing velvet beans and pigeon peas. Group 3 consists of winter-growing annuals. Group 4 is the biennial and perennial legumes, such as red clover. A photo (p. 34) shows Biloxi soybeans growing behind a vertical measuring stick at Grafton Experiment Farm

(March 1923). Address: B.Sc. (Agr.), Inspector of Agriculture.

336. Wenholz, H. 1926. Soil fertility: Its maintenance and improvement by means of rotation, cover, and green manure crops (Continued). *Agricultural Gazette of New South Wales* 37(3):229-36. March.
• ***Summary:*** Contents: Regional distribution of such crops. Soy beans are mentioned on pages 233 and 236. Also mentioned: Cowpeas, lucerne and the biennial clovers (Perennial Red, Chilian, or Bokhara), velvet beans, dolichos beans (D. lablab), pigeon peas, tick beans, field peas, vetches, etc.

Photos show: (1) A man in a white coat standing in a field of "soy beans at Emu Swamp, near Orange. The crop was grown on a poor white pipeclay soil in a very dry season." (2) A man with a hat and white shirt standing in a field of Biloxi soy beans at Grafton Experiment Farm. Address: B.Sc. (Agr.), Inspector of Agriculture.

337. Hindmarsh, Ellen M. 1926. Variations in the urease content of different varieties of soya bean (Glycine hispida). *Australian J. of Experimental Biology and Medical Science* 3(3):167-72. Sept. 16. (Chem. Abst. 21:943). [4 ref]
• ***Summary:*** Eighteen soya bean varieties were grown in Australia at Glen Innes Experimental Farm–all on the same field and in the same kind of soil. All were harvested shortly before their urease activity was determined. Table 2 shows the percentage of urea decomposed by extracts of soya beans and jack beans in a 1% urea solution at 51ºC after 15, 30, 45, and 60 minutes. There is considerable variation in the urease activity of different varieties of soya bean; some contain less than half as much as others. In a period of 30 minutes the amount of urea decomposed ranged from 22.1% to 72%. The American jack bean was found to have much greater urease activity (for hydrolyzing carbamide) than any of the soya beans, but a Jack bean grown locally in Sydney showed practically the same urease content as the more active varieties of soya bean.

"Since Takeuchi discovered the presence of urease in the soya bean this bean has been employed extensively for the detection and estimation of urea, particularly in urine and in the blood. The urease converts the urea into urea into ammonium carbonate quantitatively, and the ammonia can then be estimated by suitable means." Address: Dep. of Physiology, Univ. of Sydney.

338. Wenholz, H. 1926. Soybeans–A new farm crop. *Agricultural Gazette of New South Wales* 37(12):915-20. Dec. 1.
• ***Summary:*** Contents: Introduction. Climate and soil. Soybeans for hay. Soybeans as a supplementary crop in maize. Soybeans for seed. Place of soybeans in crop rotation.

"In soybeans Australia may be said to be on the verge of discovering what should prove, for many districts, a valuable farm crop. Soybeans were introduced and tried out, chiefly on the coast, several years ago, but were discarded as having no special merit. Further introductions (from America and elsewhere) were made more recently, and the crop was tested in some of the tableland districts with much more encouraging results."

"Mr. J.S.R. Crawford, Emu Swamp, Orange, who has probably had more experience with soybeans than any other farmer in this State [New South Wales], having grown this crop first in 1914, states that farmers in this district "'want a summer crop, a legume if possible, that we can harvest before ploughing for wheat. This is where soybeans are valuable. We either cut for hay or graze down. Sheep graze the crop right to the ground. They are very keen on it and we have found this is also the case with horses and cattle*." (Footnote: *"Rabbits are also extremely fond of soybeans.)" We are pleased with the way soybeans stand a dry time [drought].'

"Further particulars regarding the culture of this crop are given in a leaflet published by the Department of Agriculture." Address: B.Sc. (Agriculture), Special Agricultural Instructor.

339. Rout, Ettie A. (Mrs. F.A. Hornibrook). 1926. Native diet with numerous practical recipes. London: W. Heinemann. ix + 140 p. See p. 105. Preface by Sir. William Arbuthnot Lane. Illust. [10] p. of plates. 23 cm. *
• ***Summary:*** About the Maori diet. "One form of soya bean curd is called *Tofu*. When a mineral salt or acid is added to soya bean milk, coagulation is produced..."

340. Stevenson, John Albert. 1926. Foreign plant diseases: A manual of economic plant diseases which are new to or not widely distributed in the United States. Washington, DC: USDA, Office of the Secretary. viii + 198 p. See p. 171-72. 23 cm. [soy ref]
• ***Summary:*** Pages 171-72, under "Soja," list 19 diseases attacking *Soja* spp. which are new to or not widely distributed in the U.S.: "*Aecidium glycines* P. Henn. Leaf rust on *S. max* in Tanganyika and Uganda." Note: This is the earliest document seen (Aug. 2009) concerning soybeans in Uganda, or the cultivation of soybeans in Uganda.

"*Ascochyta* sp. On *S. max* in Japan.

"*Bacterium* sp. A leaf-spotting disease of *S. max*, said to be due to a bacterium distinct from other species on this host, is reported from Japan.

"*Cercospora daizii* Miura. Leaf spot on *S. max* in Manchuria.

"*Cercospora glycines* Cke. Definite dark-brown leaf spots on *Glycine clandestina* in Australia.

"*Colletotrichum glycines* Hori. Anthracnose on stems and pods of *S. max* in Japan and Chosen.

"*Fusarium* sp. Causes ring spot disease of *S. max* in Manchuria.

"*Hypochnus centrifugus* Tul. Causes cankers on stems, blighting infected plants of *S. max* in Manchuria.

"*Hypochnus cucumeris* Frank. See Cucumis.

"*Mosaic*. Mosaic disease of *S. max* reported from Japan is probably the same as the mosaic and crinkling reported from the United States.

"*Mycosphaerella phaseotarum* Siem. See Phaseolus.

"*Peronospora manshurica* (Naoum) Syd. *(P. trifoliorum* De B. var. *manshurica* Naoum.) Downy mildew on leaves of *S. max* in Siberia, India, Formosa, and Manchuria, causing premature leaf fall.

"*Phyllosticta sojaecola* Massal. *(Phaeosphaerulina sojaecola* Miura.) Subcircular, dull-brown leaf spots on *S. max* in Japan, Russia, Manchuria, and Italy.

"*Pseudomonas glycines* Nak. Circular yellow leaf spots, becoming brown to dark-brown with yellow margins on *S. max* in Japan. The spots may be as numerous as 70 to 80 per square centimeter, causing death of infected leaves.

"*Septoria glycines* T. Hem. Brown leaf spots on *S. max* in Japan and Manchuria.

"*Septoria sojina* v. Thuem. Irregular yellowish leaf spots on *S. max* in Italy, Japan, and Austria.

"*Trotteria venturioides* Sacc. Black mildew on leaves of *S. max* in the Philippines.

"*Uredo vignae* Bres. See Vigna.

"*Uromyces sojae* (P. Henn.) Syd. Brown rust pustules on leaves of *S. max* in Japan, Java, China, India, Formosa, Manchuria, and the Philippines." Address: Chief Pathological Inspector, Federal Horticultural Board.

341. Medley, R.N. 1928. Grazing trials with summer legumes: Wollongbar Experiment Farm. *Agricultural Gazette of New South Wales* 39(1):55-56. Jan.
• ***Summary:*** "A grazing trial with cowpeas, soybeans, patani beans, gotani beans, velvet beans, and Dolichos beans *(Dolichos lablab)* was conducted during the past season at Wollongbar Experiment Farm." On March 15, cowpeas gave the largest weight of green fodder (7 tons, 3 cwt per acre), followed by velvet beans, Dolichos beans, and soybeans (4 tons, 18 cwt per acre). Cattle liked to graze each of these four.

Note: Hawkesbury Agricultural College was an early agricultural college in New South Wales, located on the northern outskirts of Sydney. George Valder, who was principal by 1900, was one of the first Australians to study and write about soybeans, starting in 1898. Address: H.D.A. [Hawkesbury Diploma of Agriculture], Experimentalist.

342. *Nature's Path to Health (Melbourne, Australia)*. 1928-1952. Serial/periodical. Melbourne, Australia.
• ***Summary:*** At least one incomplete set of this periodical, from July 1930 to Jan. 1947, still exists (in private hands in Australia), bound in five volumes. The following issues are missing in that set: Vol. 8, No. 7 (Sept. to Nov. 1935). Vol. 8, No. 9 (Jan/Feb. 1936). Jan. to July 1938 (probably never published). Aug. 1940 to Dec. 1942 (during World War II; may never have been published). Apparently no library in Australia has copies; how unfortunate! The title page of the July 1930 issue shows it to be Vol. 5, No. 10. Founder and editor: F.G. Roberts, N.D. Assistant Editor and Business Manager: John E. Blackney. Address: 342 St. Kilda Road, Melbourne. In the logo is a triangle bearing the words "Natural Health Society." Volumes 1-4 may well have been published earlier in Tasmania. The July 1930 issue looks professional and well established, and gives every indication of an experienced editorial and publishing team. The Natural Health Society and magazine advertisements are also well established. In July 1930, Mr. W.H.J. Willson was Melbourne Branch president of the Natural Health Societies and Mr. David Evans was secretary of the Ballarat Branch. F.G. Roberts was the founder and national president.

The title page of the July/Aug. 1934 issue shows it to be Vol. 7, No. 2. This magazine is now "The Official Organ of the Natural Health Society of Australasia and the Australian Naturopathic Association (Regd.). Assistant editress and business manager: Mrs. G.M. Roberts"–who has apparently replaced John Blackney. The new address is 430 St. Kilda Road, Melbourne. The logo is unchanged. In Aug. 1934 Mr. H.A. Waxman was Federal Secretary of the Natural Health Society of Australasia; he lived in Melbourne. By Jan. 1935 he was business manager of *Nature's Path to Health*.

Note: A periodical with a similar title *(Nature's Path)* and content was started in 1925 by Benedict Lust in New York.

By 15 Aug. 1936 this periodical had become "The Official Organ of The F.G. Roberts Natural Health Organisation, and the Australian Naturopathic Association (Regd.)." The address was now 428-30 St. Kilda Rd.

With the issue of 1 Aug. 1938, for some unknown reason, the magazine started over numbering its issues, with this issue being designated Vol. 1, No. 1. In Sept. 1939: "Head Office: Post Office Place, Melbourne. American Contributing Editor: D. Benedict Lust, New York. *Nature's Path to Health* is the only journal in Australia that keeps abreast with the rapid advance of Natural Healing throughout the world... Naturopathy is on the advance."

The title page of the Jan/Feb. 1943 issue states: "Health articles: This magazine is a digest of the finest health articles gleaned from outstanding authorities on health and natural methods of living." Editor: F.G. Roberts, N.D. Associate Editor: Harold S. Grimes, N.D. A portrait photo on the cover shows the granddaughter of Mr. and Mrs. F.G. Roberts.

Letter from Paul Smith. 1995. May 5. The numbering system suggests that Vol. 5, which included the July/Dec 1930 issues, commenced publication in Nov. 1928. The early numbering system suggests that 4 volumes of N.P.H. may have been published prior to 1928, possibly in Tasmania. "I don't know and neither does Grahame Newitt."

343. Reynolds, Mark H.; Dunlop, D.V. 1928. Farmers' experiment plots: Summer green fodder trials, 1927-28. *Agricultural Gazette of New South Wales* 39(11):821-26. Nov.
• ***Summary:*** The section titled "Legume variety trials" notes that soybeans were grown at Singleton, Mitchell's Flat, Middle Falbrook, Maerannie, and Armidale. Biloxi and Otootan soybean varieties were planted at the rate of about 24 pounds of seed per acre. The highest yields of green forage were both at Singleton. Otootan: 11 tons, 18 cwt per acre. Biloxi: 10 tons, 2 cwt. At Armidale, rabbits ate lots of the soybeans.

Cowpeas, haricot beans, velvet beans, lupins, and grey field peas were also tested. Cowpeas gave by far the highest yields of green forage (22 tons, 5 cwt per acre). Address: Both: H.D.A.

344. *Argus (The) (Melbourne, Victoria, Australia).*1928. "Naturopath" arrested. Dec. 22. p. 15.
• ***Summary:*** "Acting on advice received at police headquarters Plain-clothes Constables Ferguson and Tauschke yesterday visited a building in Latrobe street, and arrested a man, who is alleged to have practised as a doctor without legal authority. The police visited the man as patients. Ferguson submitted himself for examination, and was later given a printed form on which a diet was prescribed. The main item of this was two orange drinks a day.

"At the city watchhouse Frederick Roberts, aged 36 years, who described himself as a naturopath, was charged with having had no lawful means of support, and with having used the title of doctor contrary to the provisions of the Medical Act."

345. *Agricultural Gazette of New South Wales.*1929. Grazing trials with summer legumes. 40(1):16. Jan.
• ***Summary:*** This is the second year of grazing trials at Wollongbar Experiment Farm. The same legumes were planted; raised caused low yields.

346. Australian Commonwealth Engineering Standards Association. 1929. Australian standard specifications for perilla oil and soya bean oil. Sydney: ACESA. 19 p. Jan. Nos. K. 12 and K. 13. See p. 11.
• ***Summary:*** The 1 page specifications for soya bean oil include: Description. Foots. Colour. Specific gravity. Refractive index. Acid value. Iodine value. Saponification value. Unsaponifiable matter. Address: Sydney, Australia.

347. Ferrée, Christian Johan; Tussaud, J.T. 1929. The soya bean and the new soya flour. London: William Heinemann (Medical Books) Ltd. xi + 79 p. Illust. No index. 22 cm. Revised translation from the Dutch by C.J. Ferree and J.T. Tussaud of Die Sojaboon en Duurzaam Sojameel. [29 ref]
• ***Summary:*** Contents: Foreword, by Sir Wm. Arbuthnot Lane, President of The New Health Society. Preface, by C.J. Ferrée (London). 1. Introduction. Literature. Name of the plant. Origin. Botanical particulars. Assimilative power of the soya plant. Inoculation. Soil requirements. Production and cost. 2. General ingredients of the various Manchurian beans. Composition. The value of soya protein. Vitamin in the soya bean. Digestibility of the soya bean and its products. 3. Use in China and Japan: Bean sauce, soy, or shoyu, Chinese chiang (paste), tou-fu or beancurd, beans consumed as a table vegetable, bean refuse and bean cake are used as a fertiliser and for fattening hogs, bean oil is used as an illuminant (where it has not been superseded by kerosene), as a substitute for lard in cooking, and as a lubricant for greasing axles and parts of native machinery, miso and natto. First imports into Europe. Exports during the last five years from China and Japan. Imports during the last five years into Europe and America. The increasing rate of its cultivation. Manchuria–Production. Estimate of the world's production of the soya bean. London the principal market. Future importance.

4. America. Australia. South Africa. Other British possessions and protectorates. Java (Dutch East Indies). Europe. 5. Unsuccessful experiments with soya flour. Ordinary soya flour. Extracted soya flour. Dr. L. Berczeller's discovery. The new soya flour. Comparison with other cereal flour and other foods. Comparison in price with other cereal flour and other foods. Comparison in price of soya protein compared with other cereal foods. Comparative analysis of cereals. 6. Soya milk. Vegetable casein. Lecithin. 7. Increase in food value. Savings. Industrial application in foodstuffs. The importance of Dr. L. Berczeller's soya flour for the food industry. Soya flour and the food laws. Uses of soya flour in: Bread, pastry, cake, biscuits, confectionery, sausages, infant foods and food for invalids, cocoa, chocolate, soup cubes, pudding flour. Uses in the kitchen. Soya flour recipes (for flour made using the Berczeller process), soya flour for diabetics, recipes for diabetics.

The Preface states: "In the following pages the writer has endeavoured to give an account of the numerous uses to which the soya bean has so far been put, and to visualise its future service to humanity through the means of a totally new and practical process by which this legume... may in future be used as an important article of food for general consumption throughout every quarter of the globe.

"In compiling the details relative to the soya bean flour, with which this brief summary principally deals, he trusts that he has succeeded in giving sufficient data to enable the reader to fully realise its value as a staple food from the economic point of view, as well as from the more domestic standpoint, so that the important fact may be fully realised that a new foodstuff of a very valuable nature... has now been brought within the reach of all nations to serve them in a most practical manner as an economic article of food."

The book includes statistics on the imports and exports from 1923 to 1927 of "soya beans, soya oil, and soya cake in various countries including China, Japan, England, France, Germany, Holland, Norway, Denmark, Sweden, and USA.

The "new soya flour" is that developed by Dr. Berczeller. This book repeatedly praises that flour. "A few years ago Dr. Laszlo Berczeller, a Hungarian physiologist in Vienna, succeeded scientifically in finding a method which enables us to prepare from the soya bean a digestible and pleasantly flavoured flour without detracting from its nutritive value, and this method entirely succeeds in preserving all the good qualities contained in the bean itself. Physiological experts and analysts withhold no praise, as the following extracts will show: -" There follow words of praise from: (1) Dr. Alfred Schwicker, M.P., Royal Hungarian State Institute, Central Depot for Experimental Chemistry. (2) Dr. Stefan Weisser, King's Counsellor, Royal Veterinary Physiological Experimental Station, Budapest. (3) Prof. A. Durig., The Physiological Institute, University of Vienna.

Marakujew (1928) estimates the production of soya beans in "Manchuria at 6 million tons at the utmost, the production of the whole of China at 16 million tons, and he is led to this figure by the conclusions of the Economic Bureau of the South Manchuria Railway, which estimates that the Manchurian crop in 1927 amounted to 37.1 million kobu (5.88 million English tons), of which 2.6 million tons originated from South Manchuria, 3.3 million tons from North Manchuria" (p. 32). A table (p. 33) gives estimated world production of soya beans from 1923 to 1929 (6.6 million tons, forecast). The leading producers in 1929 (in million tons) are: China 5.250. Japan 0.580. USA 0.250. Java and Dutch East Indies 0.120. Other Asiatic countries 0.400. A soya milk factory was recently established in Denmark (p. 54). Although this book contains a bibliography of 29 references, most are very incomplete.

Photos show: (1) A soybean plant with roots, pods, and leaves. (4) Nodules growing on soybean roots. (5) One pod and seed each from inoculated and uninoculated soybean plants. (7) An immense field of soya beans in Manchuria. (8) Soya beans awaiting shipment, in house-shaped stacks under tarps, at Dairen. (13) Seeds of the most important varieties of soya beans now grown in the United States. (10) Two horses and a farmer cultivating a field of soybeans. (11) Harvesting soya beans. (12) Well selected, clean soybean seeds.

A map (frontispiece) shows where soybeans are cultivated worldwide. An illustration (p. 2) shows Shen-Nung, "The Heavenly Farmer," reproduced from a print in a Vienna museum. One bar chart compares the nutritional composition of soya flour with that of cereals and animal products, and other foodstuffs (p. 13), another compares the calories (p. 46), and a third compares the cost of 1,000 calories (p. 48). Address: London.

348. Dorsett, P.H.; Morse, W.J. 1930. Visit to the Noda Shoyu Company, Ltd. in Chiba, Japan (Document part). In: P.H. Dorsett and W.J. Morse. 1928-1932. Agricultural Explorations in Japan, Chosen (Korea), Northeastern China, Taiwan (Formosa), Singapore, Java, Sumatra and Ceylon. Washington, DC: USDA Bureau of Plant Industry, Foreign Plant Introduction and Forage Crop Investigations. 7,410 p. Unpublished log.

• ***Summary:*** Pages 3465-67 (7 Jan. 1930). "Today we really got started on our work of looking up and getting information about soybean products. In accordance with plans made yesterday, we left Tokyo this morning (Ueno Station) at 8:15 for Noda-Machi, Japan, where we arrived at 9:45. We went direct to the office of The Noda Shoyu Company, Ltd., of Noda-Machi, Prefecture of Chiba, Japan, makers of the famed Kikkoman Shoyu.

"This company embracing 19 plants, is one of, if not the largest plants in the world brewing shoyu sauce. According to their literature, Kikkoman Shoyu was first brewed by Mr. Saheiji Mogi, in the second year of Meiwa [sic, Hoei?] (corresponding to the year 1704) in Noda-Machi, Japan.

"We met Mr. Ota, one of the assistant directors, we also met Mr. Hichizaemon [Shichizaemon] Mogi, President and Director, also a Mr. Jutaro Namiki. We spent about 1½ hours with these gentlemen in the office. Then Mr. Ota and Mr. Namiki showed us over one of their large plants. It impressed us as an up-to-date modern institution. We were in the grading and mixing room. They have 30 incubating chambers or curing rooms where the germ on the 50-50 mixture of soybean and wheat mash is grown.

"The cement vats, or aging vats, of which there are 1,500 under one roof, are made of cement and are 12 feet square and about 8 feet in depth.

"In the manufacture of shoyu sauce, this concern uses annually about 20,000 bushels of soybeans, primarily from Manchuria, and also 20,000 bushels of wheat, Japanese grown when available. They import from Australia. This year, however, they are getting their supply of wheat from Canada.

"They have 200 square (about 4 ft. by 4 ft.) hydraulic presses and 200 oblong ones about 4 ft. by 6 ft. They age their shoyu sauce 1½ years in the curing vats."

Page 3466-68. Photos show: (1) Racks of small trays, outdoors, each about 2 inches deep, 18 inches long, and 10-12 inches wide, used to cure soybean and wheat mash [koji] for making shoyu sauce (negative #44709). (2) A nearby view of the interior of one of the small trays (#44710). (3) Many round bundles of cask stock of spruce, stored outdoors. The wood will be used to make kegs for storing shoyu sauce. A part of one warehouse of the Noda Shoyu Co. is in the background (#44711). (4) A horse pulling a cart on a railroad track. On the cart are bundles of spruce stock that will be used to make soy sauce casks (#44712). (5) A nearby view of portions of ricks or bundles of short pieces of spruce for staves, tops and bottoms of small casks for shoyu sauce (#44713).

Page 3474. A photo shows a bottle (with label) of soy sauce made by Noda Shoyu Co., and materials used in its manufacture, including salt from Formosa, wheat from Canada, and soybeans from Manchuria (negative #44734).

Page 3482. A photo shows three identical bottles of Kikkoman brand soy sauce, each from a different angle so that all parts of the label are visible. Each bottle is 7½ inches tall and 2 inches in diameter, and holds one-fifth liter of sauce. Obtained on Jan. 7 from the Noda Shoyu Co. D&M item #3074. This company is the largest in the Orient (negative #44742). Address: Agricultural Explorers, from USDA, Washington, DC.

349. *Nature's Path to Health (Melbourne, Australia).* 1930. Editorial. 5(10):1. July.

• ***Summary:*** "The time has come for a loud cry to be heard everywhere; a cry to return to the God of nature, to recognize him as the source of life. All of the people may be fooled some of the time, some of them all the time, and most of them part of the time, but you cannot fool nature at any time. The public is waking up.

"Instead of resorting to uncertain and even harmful or dangerous procedures, follow the rational method of treatment. Ascertain, if possible, the cause of the illness, and remove it. If you cannot determine the cause and give yourself the help needed, look up a graduated Naturopathic Physician, who can give you the help and advice that you should have. Cease every harmful practice. Adopt correct and corrective habits of living. Do not dope or drug yourself. Do not experiment with short-cut cures... the real office of the doctor is to assist nature;..."

So begins the first page of the earliest known surviving issue of this periodical. It was written by F.G. Roberts, a naturopath (N.D.). In the top ¼ of the first page, above the title, is the circular logo of the Natural Health Society. "Founder and editor: F.G. Roberts, N.D. Assistant editor and business manager: John E. Blackney. All communications to be addressed to the assistant editor and business manager, 342 St. Kilda Rd., Melbourne." Below the logo is the society's motto: "If Health you want and Beauty too, / Now this is all you have to do. / Let Nature's foods your table grace / And so help save the human race."

Note: This is the earliest document seen (July 2007) concerning F.G. Roberts of Australia, in the 1 Oct. 1938 issue of this magazine (p. 38-39).

350. Tsao, Lien-en. 1930. The marketing of soya beans and bean oil. *Chinese Economic Journal* 7(3):941-71. Sept.

• ***Summary:*** A brilliant and very informative article. The amount of Manchurian soybean production as compared with the other leading soybean producing countries, and a discussion of the marketing of soybeans, cake and oil on the world market, are included.

"The cake saturated with from 7 to 9 per cent. of oil is of no industrial use except as cattle feed and fertilizer in the fields. The oil thus obtained is still crude. Although some large and modern mills at Harbin and Dairen produce purified and refined oil for table use, the bulk wanted by Europe is the crude variety, which is there to be made into margarine butter, gun-powder, and other industrial articles. The cake in the very early days of the industry was shipped to Ceylon for trial as fertilizer in the tea fields as remarked before, but owing to the presence of the large percentage of oil it softened and became damaged when crossing the tropics" (p. 956).

Page 969 states: "Experiments are now being made to cultivate soy beans in the French and British Sudans of Africa [later named Mali and Sudan], in unreclaimed areas of Australia, in Europe, South America, and by the time the trials will bear fruit, the Manchuria market will be unretrievable... The beancake as a fertilizer will also lose its market in Japan, now that industrialized Europe is thrusting out a chemical fertilizer in the form of powder sold at much lower prices than the beancake... Chinese oil manufacturers naively believe that the chemical as fertilizer is not suitable for the soil in Japan, but poisons it, so that the crops become of inferior quality year by year." Once continued application of chemical fertilizer assures good results, "the market for Manchurian beancake is doomed."

Note: This is the earliest document seen (Aug. 2009) concerning the cultivation of soybeans in Sudan.

An appendix (p. 970-71) lists in Chinese characters the names of the oil mills in Manchuria, by city: Dairen (41 mills), Harbin (28), Antung (20), Newchwang (19), Dairen west suburb (11), Dairen east suburb (7), Anta (7), Ashihi (3), Mankou (2), Maotangkiang (2), Angangchi (2), Tsitsihar (2), Changchun (1), Fularki (1), Imienpo (1).

351. *Agricultural Gazette of New South Wales.* 1930. Big increase in area under soybeans in U.S.A. 41(10):724. Oct.

• ***Summary:*** Extensive use of soybeans for forage and increase use for oil and meal and for human food have led to very large increases in the crop's acreage and production in the United States. Because of the good taste of the many forms in which it can be served, "the soybean has come to be considered a very desirable article of food, and its use as such is gradually increasing."

352. *Agricultural Gazette of New South Wales.* 1930. Soybeans deserving of more attention. 41(10):788. Oct.
• ***Summary:*** Soybean cultivation "in New South Wales has so far been restricted to a few experiment farms and a handful of farmers in scattered districts," but the useful of the crop is evident from these tests. "The good growth made under a wide range of conditions, the high protein value, the palatability of the forage, and the beneficial effect on soil fertility should result in the rapid extension of the area sown to the crop once farmers have given it a proper trial."

353. Ewart, Alfred James. 1930. Flora of Victoria [Australia]. Melbourne: Printed by the government printer for the University Press. 1257 p. See p. 677-78. 23 cm.
• ***Summary:*** "Glycine: A genus of about 50 species of slender, twining herbs, 7 of which occur in Australia, differing from *Kennedya* in the absence of a strophiole." The author gives detailed botanical descriptions, locations where found, and months of flowering for *G. clandestina* Wendl. (long twining stems), *G. Latrobeana* Bth. [Bentham] (short stems, not or scarcely twining), *G. tabacina* Bth., *G. sericea* Bth. (leaflets with silky white hairs). Address: Prof. of Botany and Plant Physiology in the Univ. of Melbourne.

354. *Argus (The) (Melbourne, Victoria, Australia).* 1931. A Chinese luncheon. Dec. 5. p. 8.
• ***Summary:*** The recipe for Tomato-flower soup calls for "one teaspoonful of soy-bean sauce;..."

The recipe for Chow-mein, Cantonese style calls for "one tablespoonful of soybean sauce." Later in the same recipe it is also spelled "soy-bean sauce."

355. *Argus (The) (Melbourne, Victoria, Australia).* 1931. A Chinese dinner. Dec. 12. p. 8.
• ***Summary:*** "Last week were published directions given by Nellie Choy Wong in the 'Christian Science Monitor' for the preparation of a Chinese light luncheon. The following are her directions for preparing a Chinese dinner. The ingredients may be bought at Chinese shops in Melbourne: -

"Course One.–Soy-bean Curd Soup.

"Course Two.–Mung Chi...

There follows a recipe for "Soy-bean curd soup" that includes "2 squares of soybean curd." "Season with soy-bean sauce, salt, and pepper to taste."

Note: This is the earliest document seen (Oct. 2009) stating that soybean curd [tofu] is available in Australia. That strongly implies that it was also being made in Australia, probably in the area of Melbourne, primarily for the Chinese community living there.

356. *Nature's Path to Health (Melbourne, Australia).* 1933. Directory of health aids. Aug/Sept. p. 26.
• ***Summary:*** This is a directory of F.G. Roberts' health stores and clinics in Melbourne, Geelong, Ballarat, Adelaide, Norfolk Naturopathic College at Helmsdale (Glenelg [suburb of Adelaide]), Sydney, Newcastle, Toowoomba, Brisbane, Maryborough, Rockhampton.

Roberts describes his own work and headquarters as follows: "Victoria. Home of the Nature Cure Movement. 430 St. Kilda Rd., Melbourne. Treatments in harmony with Nature. Curative Dietetics, Osteopathy, Chiropractic, Hydrotherapy, Spinal Diagnosis, Iridiagnosis, Urinalysis, Diathermy, and Blood Washing, etc. All the latest methods of natural treatment obtainable. Experienced and qualified nurses in attendance. Herbal Foods, Herbal Pills, and All Natural Remedies Obtainable. F.G. Roberts, N.D., Principal, assisted by G.M. [Gladys Maud] Roberts and Staff."

Immediately below this listing is the following: "Melbourne. Mr. W.H.J. Willson. 40 Chapel St., East St. Kilda. A nature cure dentist. The father of preventive dentistry. Call for advice."

Examples of names of the organizations listed are: "Nature Cure Health Store" (Geelong). "Natural Health Clinic" (Adelaide). "Norfolk Naturopathic College" (Helmsdale, Glenelg). "Health Food Store" (Sydney). "Nature Cure Store" (Toowomba). "Nature Cure Drugless Clinic" (Brisbane, Queensland). Address: Australia.

357. Bailey, Ethel Zoe. 1933-1982. Glycine max–Foreign sources. Ithaca, New York: L.H. Bailey Hortorium. 2 cards. Unpublished.
• ***Summary:*** These two hand-written index cards are in the Bailey Hortorium's index system of nursery catalogs and/or botanic garden seed lists developed by Ethel Zoe Bailey. In this index system, there are eleven major cards and eight minor cards related to the soybean. On each card are two-part coded entries referring to botanic gardens or nurseries.

Part 1 is the code for the name of the botanic garden, and part 2 is the last two letters of the earliest year in which the plant for that card appeared in this garden's catalog. For example "Kew 33" refers to the 1933 catalog of the Royal Botanic Gardens at Kew, England. [LR 1982] means that a list of seeds and plants (whether or not it contained soy) was "Last Received" from that source [Kew] in 1982. There are 55 listings for *Glycine max* from foreign sources. As of Nov. 1997 most of the catalogs and seed lists mentioned below are available in the Bailey Hortorium, located in Mann Library, Cornell University, Ithaca, New York.

(1) Kew 33–Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB, England, UK. 1933 [LR 1982]. (2) Taih. 34–Taihoku Botanic Garden, Taihoku, Formosa [Taiwan], 1934. (3) Adel. 50–Adelaide Botanic Garden, Adelaide, South Australia, 1950 [LR 1982]. (4) Tar. 50–Villa Taranto Gardens, Pallanza, Italy, 1950 [LR 1974]. (5) Upps. 50–

Universitets Botaniska Tradgard, P.O. Box 123, Uppsala, Sweden, 1950 [LR 1979].

(6) Port. 51–Estacao Agronomica Nacional, Oeiras (Lisboa), Portugal, 1951 [LR 1982]. (7) Camb. 51–University Botanic Garden, Cambridge, England, UK, 1951 [LR 1981]. (8) Copen. 50–Universitets Botaniske Have Kobenhaven, ø Farimagsgade 2B, DK-1353, Copenhagen K, Denmark, 1950 [LR 1981]. (9) Wien 54–Botanischer Garten der Universitaet Wien, Rennweg 14, Wien III, Austria, 1954 [LR 1976]. (10) Modena 53–Istituto ed Orto Botanico [Botanical Garden] dell'Universita di Modena, Modena, Italy, 1953 [LR 1979].

(11) P.I. 53–Bureau of Plant Industry, Dep. of Agriculture, Manila, Philippines, 1953 [LR 1953]. (12) B.A. 55–Division de Exploraciones e Introduccion de Plantas, Ministerio de Agricultura de la Nacion, Buenos Aires, Argentina, 1953 [LR 1958]. (13) N.H.L. 56–National Institute of Hygienic Sciences (formerly: National Hygienic Laboratory), Kasukabe Experiment Station of Medicinal Plants, No. 30 Kasukabe-shi, Saitama-ken, Japan, 1956 [LR 1963]. (14) Co. 57–Hortus Botanicus Conimbrigensis, Coimbra, Portugal, 1957 [LR 1982]. (15) Gater. 56–Institut für Kulturpflanzenforschung, DDR-4325 Gatersleben, Kr. Aschersleben, Bezirk Halle, East Germany, 1956 [LR 1981].

(16) Prag. 56–Hortus Botanicus Universitatis Carolinae Pragensis, Prague, Czechoslovakia, 1956 [LR 1977]. (17) Hamburg 58–Botanischer Garten Hamburg, Jungiustr. 6, Hamburg 36, Germany, 1958 [LR 1973]. (18) Milan 58–Horticus Botanicus Mediolanensis, Istituto Orto Botanico dell'Universita di Milano, Via Guiseppe Colombo 60, Milan, Italy, 1958 [LR 1980]. (19) Read. 59–Agricultural Botanic Garden, University of Reading, Reading, Berkshire, England, UK, 1959 [LR 1974]. (20) Rabat 63–Institut National de la Recherche Agronomique, B.P. 415, Rabat, Morocco, 1963 [LR 1971; Formerly: 99 Avenue de Temara].

(21) L'zig 63–Botanischer Garten der Karl Marx Universitaet, Leipzig, Germany, 1963 [LR 1976]. (22) Jena 63–Botanischen Gartens der Friedrich Schiller Universitaet, Jena, Germany, 1963 [LR 1977]. (23) Tap. 63–Institutum Agrobotanicum, Orszagos Agrobotanikai Intezet, Tapioszele, Hungary, 1963 [LR 1978]. (24) Brux. 64–Nationale Plantenuin van Belgie (formerly named Hortus Botanicus Bruxellensis), Dienst Lavende Verzamelingen, Domaine van Bouchot, B-1860 Meise (Brussels), Belgium, 1964 [LR 1981]. (25) Berg 65–Hortus Botanicus Bergianus (Bergianska Tradgarden), Stockholm 50, Sweden, 1965 [LR 1981].

(26) Pecs 65–Hortus Botanicus Pecs, Ifjusag Utja 6, Pecs, Hungary, 1965 [LR 1976]. (27) Essen 66–Botanischer Garten Essen, Hortus Botanicus Assindiensis, Essen, Germany, 1966 [LR 1977]. (28) Bonn U. 65–Botanischer Garten der Universitaet Bonn, Meckenheimer Allee 171, Bonn, Germany, 1965 [LR 1979]. (29) Kosice 68–Botanicka zahrada University P.J. Safarika, Kosice, Slovakia. 1968 [LR 1981]. (30) S.C. 68–Jardin Agrobotanico de Santa Catalina, Llavollol FNGR, Argentina, 1968 [LR 1974].

(31) Barc. 70–Institut Botanic de Barcelona, Av. Muntanyans, Parc de Montjuic, Barcelona 4, Spain, 1970 [LR 1981]. (32) Munchen 71–Botanischer Garten Muenchen-Nymphenburg, Menzi ger Str. 63 BRD, D-8000 Muenchen [Munich] 19, Germany, 1971 [LR 1981]. (33) Hohen. 72–Botanischer Garten der Landwirtschaftlichen Hochschule Stuttgart-Hohenheim, Stuttgart-Hohenheim, Germany, 1972 [LR 1981]. (34) Frank. 72–Botanischer Garten der Johann Wolfgang Goethe Universitaet, Siesmayerstrasse 72, 6 Frankfurt am Main, Germany, 1972 [LR 1980]. (35) Oxf. 73–Botanic Garden, University of Oxford, Rose Lane, Oxford, England, UK, 1973 [LR 1981].

(36) Koln 73–Botanischer Garten und Arboretum der Stadt Koeln [Cologne], Ave. Botanischen Garten, 5000 Koeln 60, Germany, 1973 [LR 1981; Formerly at Amsterdammer Strasse 36]. (37) Hal. 74–Hortus Botanicus Universitatis Halensis, Halle, Germany, 1974 [LR 1982]. (38) Gen. 73–Conservatoire et Jardin Botaniques de la Ville Geneve, Case postale 60, CH. 1292 Chambesy / Geneva, Switzerland, 1973 [LR 1981]. (39) Zurich 74–Botanischer Garten der Universitaet Zuerich (and Parco Botanico del Cantone Ticino, Isole di Brissago, Lago Maggiore), Zollikerstrasse 107, CH-8008 Zurich, Switzerland, 1974 [LR 1977]. (40) Amst. 73–Jardin Botanique de l'Universite Amsterdam, Amsterdam, Netherlands, 1973 [LR 1975].

(41) Bes. 73–Jardin Botanique de la Ville et de l'Universite (de Besancon), Place Marechal Leclerc, 25000 Besancon, France, 1973 [LR 1981]. (42) Dijon 73–Hortus Botanicus Divionensis, Jardin Botanique, 1 Avenue Albert-Premier, 21000 Dijon, France, 1973 [LR 1981]. (43) Wars. 75–Hortus Botanicus Universitatis Varsaviensis, Warsaw, Poland, 1975 [LR 1981]. (44) Berl. 75–Botanischer Garten, Berlin-Dahlem, Germany, 1975 [LR 1975]. (45) Cluj. 76–Hortus Botanicus Clusiensis, Universitas "Babes-Bolyai," Str. Republicii Nr. 42, 3400 Cluj Napoca, Romania, 1976 [LR 1981].

(46) Glasgow 77–Botanic Gardens, Glasgow W. 2, Scotland, UK, 1977 [LR 1982]. (47) Monpl. 78–Jardin des Plantes, Universite de Montpellier, Faubourg St. Jaumes, Montpellier, France, 1978 [LR 1978]. (48) Erl. 77–Botanischer Garten der Universitaet Erlangen, Schlossgarten 4, Erlangen, Germany, 1977 [LR 1977]. (49) Groz. 80–Hortus Agrobotanicus Instituti Agronomiei "Dr. Petru Groza," Cluj, Romania, 1980 [LR 1980]. (50) Duss. 79–Botanisches Institut der Universitaet Duesseldorf, Christophstrasse 82, Dusseldorf, Germany, 1979 [LR 1981].

(51) Tubin. 80–Botanischer Garten der Universitaet Tuebingen, Tubingen, Germany, 1980 [LR 1980]. (52) Vac. 82–Research Institute for Botany, Hungarian Academy of Sciences Botanical Garden, 2183 Vacratot, Hungary, 1982

[LR 1982]. (53) Graz 82–Botanischer Garten der Universitaet Graz, Holtei-Gasse 6, A-8010 Graz, Austria, 1982 [LR 1982]. (54) Jo. 81–Botanical Garden, Univ. of Joensuu, P.O. Box 111, SF-80101 Joensuu, Finland, 1981 [LR 1981]. (55) Utr. 82–"Hortus Botanicus" Utrecht & "Cantonspark" Baarn of the State University of Utrecht, Utrecht, Netherlands, 1982 [LR 1982]. Address: L.H. Bailey Hortorium, 462 Mann Library, Cornell Univ., Ithaca, New York 14853-4301. Phone: 607-255-7981. Fax: 607-255-7979.

358. Elliott, H.G. 1934. Soya bean trials, 1933-34. *J. of the Department of Agriculture of Western Australia* 11:327. June.

• ***Summary:*** "The soya beans which were obtained through the courtesy of the Ford Motor Company of Australia were the subject of experiments at various centres to determine their possibility as a summer growing legume..." The soybeans were to be used as a protein-rich fodder. A table gives the results of the trials for the season 1933-34 in 4 locations in Western Australia: Margaret River, Muresk, Denmark, and Munja Station. The soybeans generally failed even though all seeds were inoculated with the "Soya bean bacteria" just prior to planting. "It is believed that this crop is quite unsuitable in Western Australia, with the exception perhaps of some of the irrigated areas." Cow peas do better as a summer legume. Address: Agricultural Adviser, Dairy Branch.

359. *Nature's Path to Health (Melbourne, Australia).* 1934. Editorial: Divine care. 7(2):1. July/Aug.

• ***Summary:*** "Man's life is nourished, sustained and supported by the Eternal Spirit. Everything than man needs, both spiritually and temporarily, has been provided for him from before the foundation of the world. The Divine purpose concerning each one of us is not penury, lack, disaster and disorder, but sufficiency, harmony, order and every possible form of good. If we think otherwise this in itself is sufficient to separate us from the good which God has designed for us.

"The first thing to do is, therefore, to live in the thought and consciousness of this truth that God, Who is the One Source of all life, abundance, good and joy, has prepared for us all that we need in the Divine Providence. We should continually acknowledge to 'our Father' that all good comes from Him... This is the first step in what is termed Right Thinking–to think from the standpoint that all good comes from the Lord, and that good can only come from Him..." [By F.G. Roberts, N.D., soyfoods pioneer in Australia]. Address: Australia.

360. *Argus (The) (Melbourne, Victoria, Australia).* 1935. Adventists in camp: Rise early, dine cheaply. Jan. 18. p. 11.

• ***Summary:*** "Seventh Day Adventists in camp at West Preston are early astir. The rising bell is run at 6 a.m."

"Meals are cheap. Foods are obtainable at 1*d.* and 2*d.* a portion and a good dinner may be purchased for 9*d.* There is no meat and no tea in the diet. A typical menu is as follows–Savoury soup, macaroni, and nut meat, potato pie roast and mashed potatoes, cabbage, parsnips, and parsley sauce, beetroot, soja beans, steamed bread pudding, and creamed rice."

361. *Nature's Path to Health (Melbourne, Australia).* 1935. Editorial: Divine care. 8(1):1. Jan.

• ***Summary:*** "But the meek shall inherit the earth, and shall delight themselves in the abundance of peace (Psalms 37,11)."

"That which is seen is temporal, but that which is not seen is eternal. That which is visible is supported by that which is invisible: therefore, when the support of the invisible is withdrawn, that which is visible disintegrates." [By F.G. Roberts, N.D., soyfoods pioneer in Australia]. Address: Australia.

362. *Nature's Path to Health (Melbourne, Australia).* 1935. General President's lecturing tour. April 1. p. 33.

• ***Summary:*** The General President, F.G. Roberts, will be conducting a 1-month circuit lecture tour up and down the west coast of Australia (New South Wales and Queensland) to the following cities: Sydney and Lakemba (April 1-3, May 1-3), Newcastle (April 4-5, April 29-30), Toowoomba (April 8 & 26), Brisbane (April 9 & 24), Maryborough (April 12, 22-23), Bundaberg (April 15 & 19), Rockhampton (April 16-18). Address: Australia.

363. *Queensland Agricultural Journal.* 1935. Soy beans–Limitations under local conditions. 43(4):429. April 1. (Dep. of Agriculture, Brisbane).

• ***Summary:*** Notes on the disappointing trials in New South Wales. Address: Australia.

364. *Agricultural Gazette of New South Wales.* 1935. Soybeans and cowpeas on the Far North Coast. 46(4):231. April.

• ***Summary:*** Providing fodders rich enough in protein for dairy cows "is a problem on many farms in the Upper North Coast district." Trials of summer leguminous crops were "arranged at Woodburn, Coraki, Kangaroo Creek and Coramba by Mr. M.J. Squire, Agricultural Instructor." Soybeans gave the best results, better even than cowpeas. Otootan and Easycook soybean varieties were tested.

365. *Agricultural Gazette of New South Wales.* 1935. The possibilities for soybeans. 46(5):264. May.

• ***Summary:*** Mr. W.D. Kerle, H.D.A., Special Agricultural Instructor, has written the introduction to a leaflet on soybeans, which is available, free of charge, from the NSW Department of Agriculture, Box 36A, G.P.O., Sydney. He notes that soybeans have long been a staple food in many East Asian countries.

During the past 20 years in New South Wales, many varieties have been introduced and numerous field trials have been conducted throughout the state.

"The results, in the main, have been disappointing, however, and efforts to establish soybeans as a commercial crop have met with little success. The growth has been erratic–at times luxuriant but more often medium to poor–while grain yields, chiefly as a result of poor seed due primarily to some unfavourable climatic influence, have been low." Another reason for poor results appears to be the absence in local soils of the particular bacteria association with the growth of root nodules on the plants. This is confirmed by recent experiments at the New England Experiment Farm, Glen Innes, where commercial inoculum from the United States increased seed yields by 6 bushels / acre over seed not inoculated.

Also discusses use of soybeans for green manure and fodder purposes, and as human food.

Rabbits and hares have a special fondness for soybeans in their younger stages of growth, and it is futile to attempt to grow them unless they are well netted in areas where these pests are prevalent.

366. *Argus (The) (Melbourne, Victoria, Australia).* 1935. Meetings, lectures, etc. Aug. 24. p. 15.
• ***Summary:*** "AAA–Natural Health Society. Queen's Hall, Collins St. Monday, 8 p.m. Australia's Leading Naturopath, F.G. Roberts, N.D., D.O., lectures. 'Mental Therapeutics in Business and Disease.' Crowded hall will again welcome this 'Master Mind.'"

367. Kanehira, Ryôzô. 1935. An enumeration of Micronesian plants: Glycine. *J. of the Department of Agriculture, Kyushu University* 4(6):237-464. Nov. 30. See p. 334, 340. [15* ref. Eng]
• ***Summary:*** Page 334 reports *Glycine clandestina,* distributed from Australia to Formosa, and in Tinian, Pangan [Pagan], and Saipan. Note: Tinian and Saipan are islands in the Mariana Islands.

Page 340 reports *Glycine lucida* found in forests at medium altitudes from Ceylon to Polynesia.

Note: This is the earliest document seen (March 2010) concerning soybeans (but only wild perennial relatives of soybeans) in the Mariana Islands; cultivated soybeans have not yet been reported. Address: Kyushu Imperial Univ., Japan.

368. **Product Name:** Vita-Elm (With Slippery Elm). Blend of Cereal and Soy Flours plus Slippery Elm had started by 1948.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia. Phone: (03) 729-1738.
Date of Introduction: 1935?
Ingredients: 1995: Wholegrain wheat flour, barley flour, maize flour, oat flour, wheatgerm flour, wholegrain rye flour, whole soya flour (with oil and lecithin intact), and slippery elm.
Wt/Vol., Packaging, Price: Tin-plated steel can.
How Stored: Keep sealed. Store in a cool, dry, lightfree place.
New Product–Documentation: Ad in *Nature's Path to Health* (Melbourne, Australia). 1932. Oct. p. 21. "Good health by taking Vita Elm. Makes invalids strong. Children thrive on it. Invaluable to the athlete. Vita-Elm contains the germ of life of wheat, oats, barley, rye, and maize. [Note: Soy is not mentioned]. Abounding in all the valuable vitamines that give strength, energy and vitality. Delicious flavour. Nourishing. Nature's food. Obtainable at 342 St. Kilda Road, Melbourne, SC1."

Ad in Nature's Path to Health. 1935. May 1. Vita-Elm is now promoted as a "vitalizer" that can give "glorious health." Ad in Nature's Path to Health (Australia). 1937. Christmas. p. 36. "Natural health baby. Esmae Noelene Grimes. Aged four and a half months. Thrives on Vita Elm Dinner." A photo shows baby Esmae (the Roberts' granddaughter, aged 4½ months) sitting up and enjoying Vita Elm. Paul Smith notes (28 March 1995): "Esmae was reared on Vita Elm and Soy Compound and was using both at the time of the photo as her mother was experiencing difficulty in breastfeeding Esmae. As Esmae also later experienced difficulty in breastfeeding her own children, and resorted to the same two remedies... Esmae and family still purchase Vita Elm and Soy Crunch directly from us."

Ad in Nature's Path to Health. 1940. July. p. 36. "Vita-Elm builds bonny boys and girls. To avoid malnutrition and the many ills that beset children, a fully fortified food must be provided... Protect them from winter colds and deficiency disease by daily use."

Information brochure: "'Vita Elm' was originally developed as a therapeutic product to assist invalids of all ages to recuperate. Bland, nutritious, sustaining and easily digestible it is an ideal way to encourage people recovering from surgery or suffering from hiatus hernia, ulcers or diarrhoea [diarrhea] back onto solid foods. It also forms a valuable addition to the diets of infants, toddlers and children of all ages. Slippery Elm has long been recognised for its soothing, gelling properties and its ability to gently coat the sensitive linings of the human digestive system." Serve as a porridge, and a hot or cold drink or thickshake.

Letter from Paul Smith. 1995. March 14. "Interestingly none of the advertisements for Vita Elm from the mid-1930s into the 1950s acknowledge the use of soy in this product. However the practise of adding soy flour to Vita Elm was well established when my father, Ron, went to work for F.G. Roberts early in 1948, and he believes soy was used by the mid-1930s. Admittedly, it is a minor ingredient." "Esmae believes the soy was added to Vita Elm in 1937, when Roberts first became interested in it."

Letter from Paul Smith. 1995. April 1. Vita Elm was the most heavily, longest and continuously promoted of all the Roberts products from its inception in Oct. 1932 until 1947, in almost every issue of the magazine. A 2-page table shows, for each issue, on what page the ad appears.

369. *Advent Review and Sabbath Herald.* 1936. Obituaries: W.A. Colcord. 113(1):21. Jan. 2.
• ***Summary:*** William Allan Colcord was the husband of Mrs. Anna L. Colcord, who survives him. He was born on 8 Dec. 1860 at Coleta, Illinois. At about age 24 [ca. 1884] he became a Seventh-day Adventist and became a member of the church at Grand Junction, Iowa. Education: He attended the academy at Rockford, Illinois, and still later was a student in the Battle Creek College at Battle Creek, Michigan.

He began his work as a preacher of the gospel in 1886, laboring first in Des Moines, Iowa. From about 1893 to 1902 he preached in Australia. Returning to the USA, he worked at the denominational headquarters in Washington, DC, where he served for a number of years as one of the secretaries of the Religious Liberty Department, and later he became book editor for the Review and Herald Publishing House.

Not long after this he lost his faith in SDA doctrines and withdrew from the denomination. But in due time he became convinced of his mistake, returned with sincere repentance, was rebaptized, and again became a member of the church. He died on 4 Nov. 1935 at Washington, DC. He was the son of Ivory G. and Charlotte Colcord. The detailed biography does not mention when or where he married. In addition to his wife, he leaves two sons, Clarence G. and Glenn A. Colcord, and one daughter, Mrs. Walton C. John.

Note 1. His wife was the author of an excellent Seventh-day Adventist vegetarian cookbook, *A Friend in the Kitchen*, first published in 1899. Note 2. Janice Little of Del E. Webb Memorial Library, Loma Linda, California, was unable to find the birth or death dates of Anna L. Colcord (Dec. 2004).

370. *Agricultural Gazette of New South Wales.* 1936. Maize and legume silage: Balanced rations for the North Coast. 47(1):58. Jan.
• ***Summary:*** Lucerne does not thrive in many areas of the Upper North Coast district. "As one way of approaching this problem, velvet beans and soy beans were grown in trials at Swan Bay (Richmond River), Kangaroo Creek, and Coramba, to put into the silo with green maize in the proportion of three loads of maize to one of legume with a view to improving the feeding value of the silage." Soybeans were found to give better results than either velvet beans or (previously) cowpeas. Mr. M.J.E. Squire, Agricultural Instructor, concluded that the Otootan soybean is the most suitable for this purpose.

"For the successful cultivation of soybeans, vermin-proof areas are required, as hares, rabbits, etc., are very severe on them during the seedling stage."

371. *Argus (The) (Melbourne, Victoria, Australia).* 1936. Meetings, lectures, etc. March 28. p. 17.
• ***Summary:*** "AAA–Roberts' Health Organization, Queen's Hall, 181 Collins St. Monday, 8 p.m. F.G. Roberts, N.D., D.O., leading Naturopath and Health Lecturer, will speak on 'Nature Cure in Australia.' Lantern and movie illustrations. Collection. Questions answered."

372. Guillaumin, A. 1936. Matériaux pour la flore de la Nouvelle-Calédonie. (XL) Revision des Légumineuses [Materials for the flora of New Caledonia. (XL) Revision of the Leguminosae]. *Bulletin de la Societe Botanique de France* 83(4):294-315. March/April. See p. 300. [Fre]
• ***Summary:*** *Glycine tomentosa* and *G. tabacina* exist in New Caledonia. A botanical description of each is given.

373. Russell, John. 1936. The culture of the soya bean in England. *J. of the Ministry of Agriculture (Great Britain)* 43(1):24-30. April. [4 ref]
• ***Summary:*** Cultivation of maize and the soya bean in England began at a relatively late date. "Much important work on selection and hybridization of these crops has been done by Professor W. Southworth, formerly of the Manitoba Agricultural College [in Canada], and now of the Rothamsted Experimental Station." Some 30 years ago [about 1906-10] Professor [James] Hendrick tried to grow the soya bean at "Aberdeen [Scotland], using Manchurian seed; in the greenhouse a few plants grew and even flowered, but they never produced seed, while in the open the seeds hardly germinated.

"Further south, at Kingston and Kegworth in the Midlands, Mr. Golding obtained better results with Japanese seed, and indeed he used the plant for some of his pioneering investigations on nitrogen fixation by leguminous plants, working with a culture supplied by Hiltner, then of Munich [Germany]. Although it was useful for laboratory investigations the crop held out little promise to the practical farmer. Similar negative results were obtained by Sir Rowland Biffen at Cambridge. A summary of these tests was given in this Journal in April, 1912 (p.33). A little later in the summer of 1912 and 1913, soya bean was tried at the Woburn experimental farm, but although the seed germinated satisfactorily and the plant grew, as in Mr.

Golding's experiments, only a few pools were produced, and it was clear that the varieties tested were useless to this country. Still further south, in the old Royal Botanic Society's Gardens, Regent's Park, Mr. J. L. North, the Curator, was more successful than any of his predecessors: he began in 1914 and within a few years was growing a number of varieties and found some that ripened seed ready for harvesting in September. A brown variety seemed so promising that by 1929 it was taken up for further trial by the National Institute of Agricultural Botany and by Messrs. Sutton and Sons. Meanwhile Mr. North received other varieties from Professor McRostie, of Ontario [Canada], and these were included in his trials-but they all failed.

"This brown variety had been obtained by Professor Southworth about 1916 at the Manitoba Agricultural College, and was fully tested and ready for distribution by 1922. It was a selection from Ogemaw, a hybrid between an early black and a dwarf brown variety produced by E.E. Evans at West Branch, Michigan, in the opening years of the present century. Like all hybrids, it is variable, and Professor Southworth's selection differed in such important respects from the parent material that it was issued as a distinct variety under the name Manitoba Brown. This was sent to Mr. North and grown by him: he described it in the *Quarterly Summary* of the Royal Botanic Gardens, for April, 1929, as having 'in the course of seven years' trials here proved to be not only the most reliable cropper, but the earliest of any of the sixty varieties of soya tested by me for growth in this country for the last fourteen years.' Although Mr. North gives no estimate of yields he quotes Messrs. Chivers' estimate of 12 to 15 cwt. [1 cwt = hundredweight = 112 pounds] of grain per acre, and soya beans sold at that time at £13 per ton. Mr. North states also that the soya bean has been grown successfully in the Home Counties, Oxfordshire, Hampshire and the Channel Islands, but gives no figures of yields in any of these places. The National Institute of Agricultural Botany grew it in 1924, 1925, and 1926 from Mr. North's seed, and each year had a fair crop of seeds: in 1928 large plots were grown and the yield was estimated at 900 lb. per acre without inoculation and 1,150 lb. per acre with inoculation. The results seemed so promising that half an acre was sown in 1929, but the plants ripened irregularly and produced little seed. The trial was then discontinued."

Mr. North continued his trials and "was fortunate in enlisting the sympathy of Mr. Henry Ford, who in 1932 had purchased some 2,000 acres of agricultural land at Boreham in Essex and proceeded to sow some Michigan varieties of soya bean. These failed, but in the meantime Mr. Ford discovered Mr. North, who furnished him with the above variety and three others, and these have been grown since 1933... Meanwhile in 1932 Professor Southworth, the originator of the most successful of these varieties, had retired from the Manitoba Agricultural College and joined the Rothamsted Staff. He started growing his best selection at the Woburn Experimental Farm... Professor Southworth himself has been growing the crop both at Rothamsted and at Woburn since 1934." Cultures for inoculating soya beans are obtainable from Messrs. Allen and Hanbury, 3 Colts Lane, Bethnal Green, London, E.2.

Note 1. This is the earliest document seen stating that the soya bean was grown at Rothamsted, the world's first agricultural experiment station, established in 1843.

Note 2. This document contains the earliest date seen for soybeans in Scotland, or the cultivation of soybeans in Scotland (About 1906-1910). The source of these soybeans is unknown (One of two documents).

Note 3. This is the 2nd earliest document seen (March 2010) concerning soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands. This document contains the 2nd earliest date seen for soybeans in the Channel Islands, or the cultivation of soybeans in the Channel Islands (April 1936). The source of these soybeans was Mr. North. Address: Sir, D.Sc., F.R.S., Director, Rothamsted Experimental Station [England].

374. Breedlove, L.B. 1936. Soy bean–The magic plant: Different varieties suitable for any climate or soil. Article III. *Chicago J. of Commerce and La Salle Street Journal.* June 6. p. 11.

• ***Summary:*** Contents: Introduction. Soya max only important specie [sic, species]. Imported seeds badly mixed. Thrive in our climate. Soil preferences of the soya. Varieties recommended by official agronomists. Trend in the varieties grown.

A large table titled "Soybean varieties recommended for the different growing areas," contains 25 large boxes, each containing the names of 5 to 12 soybean varieties. Across the top are cropping for seeds, hay, pasture, or silage. Down the left side are regions I through V. Region V (a northerly region), for example, is "Very early and early varieties, maturing in 90 to 110 days. The varieties in Region V best suited for producing seed are: Aksarben, Black eyebrow [Black Eyebrow], Elton, Habaro, Ito San, Mandarin, Minsoy, Ogemaw, Soysota, and Wisconsin.

Varieties now gaining favor in the "corn belt district" are Illini, Manchu, Dunfield, Mansoy, and Laredo.

"The soybean belongs to the genus Soja, family of Leguminosae–the second large family of seed plants whose species total over 12,000. Of the fifteen species of the genus native to Asia, Africa and Australia only one, Soja Max–the soybean–produces sufficient protein and other chemical properties to be of economic importance." Note the use of the terms "the soya," "Soya Max," and "Soja Max" to refer to the soybean.

"The soybean is a self-fertilizing plant: the flowers produce both the pollen grains and ovules. Pollination occurs before the flower opens and there is little chance of pollen from other plants carried by insects or by falling from other plants to enter and effect fertilization.

"Apparently Chinese emperors or imperial gardeners gave no thought to improving the soybean strains, while the farmers naturally enough, had no idea that controlled propagation was possible. So, through the centuries, the god of soya had to look out for himself. However, as the plants rubbed shoulders slight variations came into existence, to be handed slowly on as the crop seed was planted again and again, in spite of the soya god. Even at that, plant variations through mutation, without the necessary artificial segregation of the plants, developed slowly." Address: Staff member, Chicago Journal of Commerce.

375. *Nature's Path to Health (Melbourne, Australia).* 1936. Soya Bean growing for the Australian garden. July 15. p. 35-36.

• ***Summary:*** Written by F.G. Roberts, pioneer of soyfoods and soybean cultivation in Australia. "Regarding the future of Soya Beans in Australia, the following may be quoted from an English contemporary: 'The seeds will soon be acclimatized to produce good crops in England. Besides proving a delightful new vegetable, the seeds saved should pay for all the trouble, and you will be able to say, "I grew them before the British farmer thought of doing so."'

"The two harvests that have since taken place have turned the above prophecy into accomplished facts.

"There appears to be no reason why every enthusiastic food reformer with a small garden should not try his, or her, hand at growing Soya Beans. The offering of acclimatized seeds, green, yellow, and brown, by the 'Pitman' Health Food Co., for the first time in their March, 1935, catalogue, resulted in their supplying a hundred packets within a few days, the demand continuing up to planting time, May 1st, when supplies were exhausted."

The soya bean should eventually provide "the farmer with an additional profitable crop for the oil crushers and a large number of other important purposes. The writer, who has made a hobby of gardening for more years than he cares to count, considers that his 1935 crop of soya beans is the first thing he has ever grown that has paid him financially...

"Four varieties were planted on May 1st, 1935, one row of black" (93 seeds) and five rows each of brown, green, and yellow (372 seeds each). Details of planting and growth are given. The whole patch was about 45 feet by 27 feet. On August 4th the different varieties were all healthy and of different heights: yellow 30-34 inches, green 12-18 inches, brown 20-24 inches, and black 18-24 inches. At the end of August the plants were all very strong but at different stages of flowering and bearing fruit. The black and brown varieties gave the best yields, increasing 56 fold and 50 fold in weight respectively. Green increased 35 fold and yellow 34 fold.

"The Soya Bean has been very successfully grown in Australia. There is a sample at 'Kalimna," Melbourne from Mrs. Drury's garden at Murrumbeena [a suburb in Melbourne, to the south east, in Victoria]. Others, too, have had equal success, which goes to show that Soya beans can be grown just as successfully in Australia in as Overseas. Remarkable success has also been obtained in England with the growing of the Soya Bean.

"As the Soya Bean is such a wonderful food, we feel sure it would be a very good food to encourage the growth of in Australia, therefore we will send to any subscriber a packet of beans on the receipt of 3d. in stamps to defray postage on the same–Editor."

Note 1. This is the earliest article on soybeans seen (July 2007) in *Nature's Path to Health.* Paul Smith of Soy Products of Australia (Pte.) Ltd. has examined issues dating back to Oct. 1932, and as late as Feb. 1950. The magazine was published by F.G. Roberts, a naturopath living in Melbourne.

Note 2. This is the earliest document seen (July 2007) concerning Soy Products of Australia Pty. Ltd. (Bayswater, Victoria, Australia), formerly F.G. Roberts Health Food Products (Melbourne).

Note 3. This is the earliest document seen (July 2007) concerning F.G. Roberts' and soybeans or soyfoods.

Note 4. This article was reprinted in the 1 Oct. 1938 issue of this magazine (p. 38-39).

376. *Nature's Path to Health (Melbourne, Australia).* 1936. "Whatsoever a man soweth..." Aug. 15. p. 26.

• ***Summary:*** "On Grower St., near the University of London, where I studied food-chemistry in middle-life, after my health broke down, was a famous boarding-house. There I daily bored the guests with the newer knowledge of nutrition I was acquiring." The author (presumably F.G. Roberts) then urges his readers to eat more salads, green vegetables, and fresh fruits to avoid the "danger of acidosis. By that term we really mean a shortage of alkalies. If the blood actually contained more acids than bases, death would immediately occur. Nature continually struggles to prevent such a catastrophe."

377. Siegmeister, Walter. 1936. Soy beans. *Nature's Path to Health (Melbourne, Australia).* Aug. 15. p. 25-26.

• ***Summary:*** "Soy Beans contain a Complete Protein which can replace the proteins of meat, eggs, and milk.

"The verdict of modern biochemistry is that the alkalinity of the blood is the basis of physical and mental health, while a rise in acidity means lowered vitality and increased susceptibility to disease. Therefore it is of the highest importance to keep the blood alkaline. To do so, we must avoid acid-forming foods, consume those with an alkaline ration, and above all, thoroughly oxygenate the lungs with pure oxygen. Unless carbon dioxide is removed as quickly as it forms, there will be a rise in the carbonic acid content of the blood which means increased acidity.

"Chief among the acid-forming foods are meats, fowl, fish, eggs and grains. Flesh foods putrefy readily and hence are causes of constipation and intoxication... The soy bean is highly alkaline (as are potatoes and bananas)... It is one of the few vegetable proteins with a full biological value equal to that of meat, eggs, or milk. Soy bean powder [flour] dissolved in water makes a milk which has been found by experiments to be able to replace cow's milk in the feeding of infants."

"Butter is acid-forming; so are most vegetable oils. Soy bean oil is the only oil found to be alkaline in reaction and to contain vitamin D..."

Note: This is the earliest document seen (June 2002) concerning a vegetarian diet and mental health. Address: PhD.

378. *Agricultural Gazette of New South Wales.* 1936. Chemistry and agriculture: The soybean. 50(8):427. Aug.
• ***Summary:*** The soybean, originally grown for food use in East Asia, has recently found an increasing number of industrial applications, as in the making of enamels, varnishes, paints, printing inks, glues, linoleums, plastics etc.

In 1938 some 57.665 million bushels of soybeans were produced in the USA. This large increase was due to two main factors: increased acreage harvested (2.898 million) and increased yield per acre (19.9 bushels, up from 14.2 average in 1927-36).

"So important has the industrial aspect of soybean production become in the U.S.A. that a Soybean Industrial Products Laboratory has recently been established at Illinois to investigate the effects of varietal and cultural differences on the composition of the plant, and to engage in chemical research with a view to furthering the industrial uses of its various constituents."

379. Kaltenbach, D.; Legros, J. 1936. Soya: Selection, classification of varieties, varieties cultivated in various countries. *Monthly Bulletin of Science and Practical Agriculture (International Institute of Agriculture, Rome)* 27(8):281T-97T. Aug.
• ***Summary:*** Contents: Part 4. C. Asia. IV. Varieties cultivated in various countries (concluded). 1. Ceylon. 2. China and Manchuria. 3. Federated Malay States. 4. India: Punjab, Bihar and Orissa, Burma, Berar, Presidency of Madras, Presidency of Bombay, Bengal and Neighbouring Indian States, Assam, North West Frontier Province, United Provinces. 5. Netherlands Indies. 6. Indo-China (incl. Tonkin, Annam, Laos, Cambodia, and Cochinchine). 7. Palestine.

D. Africa. 1. French West Africa [only Mali]. 2. Algeria. 3. Belgian Congo. 4. Egypt. 5. Morocco. 6. Rhodesia. 7. Anglo-Egyptian Sudan. 8. Tripolitania [later part of Libya]. 9. Tunisia. 10. Union of South Africa.

E. Oceania. 1. Commonwealth of Australia: Southern Australia, New South Wales, Queensland, Victoria. 2. Hawaii. 3. New Caledonia.

"7. Palestine. Soya cultivation is not practised in this country though trials have been made at the Mikweh Israel School at Jaffa, but with very little success. A few variety trials were made in 1935 at the Experiment Station of the Department of Agriculture, but no satisfactory results were obtained."

"2. Hawaii–Soya growing was introduced in 1908 at the Experiment Station of Honolulu. It is grown at present only on a very small scale. Trials in adapting varieties are carried out by the Agronomical Division of the Experiment Station of the University of Hawaii, Honolulu.

"No native varieties are grown. The foreign varieties came from the United States, the principal being: Biloxi, Mammoth Yellow, Tokio and a few varieties utilised for green vegetables... The yields vary between 600 and 1200 lbs. of seed per acre."

Note 1. This is the earliest document seen (Dec. 2007) concerning soybeans in Israel (though it was not named Israel until 1948), and Palestine, or the cultivation of soybeans in Israel, or Palestine.

Note 2. This document contains the earliest date seen (Dec. 2007) for soybeans in Palestine / Israel, or the cultivation of soybeans in Palestine / Israel (1935; one of two documents). The source of these soybeans is unknown. Address: Rome, Italy.

380. Kaltenbach, D.; Legros, J. 1936. Soya: Selection, classification of varieties, varieties cultivated in various countries: Oceania (Document part). *Monthly Bulletin of Science and Practical Agriculture (International Institute of Agriculture, Rome)* 27(8):294T-97T. Aug.
• ***Summary:*** "1. Commonwealth of Australia: A. Southern Australia. Apart from a very few trial plots, soya growing is not practised in this State as the conclusion has been reached that local climatic and soil conditions are not suitable for this crop.

"B. New South Wales. Several years ago, the Department of Agriculture tried to introduce soya into the agricultural economy of the State, either as a green manure or forage or for the multiple uses of the seed. During the last 20 years, numerous varieties have been introduced and many trials have been carried out in all parts of the country. Generally speaking, the results were not satisfactory and efforts to introduce soya into the economy of the country were not successful. The growth of the soya plant was very poor and the yields in seed low. One of the reasons why soya does not succeed seems to be the absence of the bacteria of root nodules in the soil of this State. Utilised as a spring green manure, soya is inferior to cow peas in the coastal regions. In the Table-lands soya cultivation appears to give better results.

"C. Queensland. Soya has been grown experimentally in this country for a great number of years, but the results were more or less negative and the areas now cultivated with soya are almost negligible.

"A few very tall varieties, such as Biloxi and Otootan, have proved to be suitable as forage, but they have not been adopted by farmers, who obtain forage more easily in cultivating cow peas or other leguminous plants.

"Trials in inoculating soya seeds do not appear to have given any results though other trials should be carried out in the agricultural districts before this crop can be said to be quite unsuited to this State.

"The internal market for soya and its derivatives is limited as it is supplied by imports from Manchuria and Japan.

"Owing to the abundant production of all kinds of feeds for live-stock, the use of soya will be difficult to establish unless it is utilised in crop rotation with cotton or maize.

"D. Victoria. No systematic attempts have yet been made to introduce soya growing into this State. Various trials previously made for experimental purposes showed that this crop was not of sufficient economic interest to replace the existing crops of leguminous plants.

"In 1933, however, the Department of Agriculture undertook a series of trials in soya growing in East Gippsland...

"Imports into Australia are of no great importance. In 1932-1933, 40,808 gallons of soya [soy sauce] were imported; value £1778. Of these imports 90% came from China. During the same period 12 tons of seed were imported from Japan; value £148.

"3. New Caledonia. Soya cultivation was introduced in 1928. No native varieties are grown, only foreign varieties, seeds of which were introduced on two occasions by the Chamber of Agriculture and the Administration. The principal variety is *Soja hispida*. Medium yields are obtained. There appears to be no future for soya as New Caledonia is abundantly provided with similar products which are in current use."

Note: This is the earliest document seen (March 2010) concerning soybeans in New Caledonia, or the cultivation of soybeans in New Caledonia. This document contains the earliest date seen for soybeans in New Caledonia, or the cultivation of soybeans in New Caledonia (1928). The source of these soybeans is unknown. The history and present status of the cultivated soybean, *Glycine max* is unclear. Address: Rome, Italy.

381. **Product Name:** Roberts Soy-Wheat Macaroni.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 430 St. Kilda Road, Melbourne, S.C.2, Victoria, Australia.
Date of Introduction: 1936. August.
How Stored: Shelf stable.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia)*. 1936. Aug. 15. p. 8. "Look for the name on the packet. Health Brand (a logo illustration shows a stylized portrait of F.G. Roberts wearing a bow tie). 12 ozs. Nett. "Obtainable at all Health Centres." Note: It is not clear who manufactured this product, and where it was made.

Ad in *Nature's Path to Health (Melbourne, Australia)*. 1937. Sept/Oct. p. 34. "The perfectly balanced food. Made by and obtained at Roberts Health Services throughout the Commonwealth." Address: 40 Chapel St., St. Kilda. Same ad in Nov/Dec. 1937 issue, p. 14 and in the Christmas 1937 issue, p. 19 and 28. However on p. 28 we read: F.G. Roberts, N.D., D.O. [Doctor of Osteopathy], 430 St. Kilda Road, S.C.2.

Note: This is the earliest known commercial soy product made in Australia. In fact, F.G. Roberts Health Food Products, which made only vegetarian food products, launched the first twelve commercial soy products in Australia. The first soy product introduced by Sanitarium Health Food Co. in Australia was launched in 1954. It was named "Soya Beans in Tomato Sauce."

382. Kellogg, John Harvey. 1936. Soybeans as human food. *Nature's Path to Health (Melbourne, Australia)*. Nov. 15. p. 9.

• ***Summary:*** Dr. Kellogg wrote an article and gave a speech on this subject in the USA in 1930-31. After summarizing the nutritional benefits of soybeans, he discusses a new subject. "The soy bean contains progestin, hormone of the human ovary–Aid in sterility seen. Dr. Willard Allen, biological chemist of the University of Rochester [New York], recently received an award for his discovery that the Soy Bean may be made to reproduce the action of the female reproductive gland. Dr. Allen's discovery was that the action of the corpus luteum of the human ovary, which plays an essential role in the process of reproduction, could be created chemically through the Soy Bean.

"By the use of an extract of pig's corpora lutea injected into sterilised rabbits, after fertilization, it was found that a reproductive process which would otherwise have been interrupted by sterilization, could be continued. In other words, the hormone Progestin, used in this manner would restore the normal reproductive process after an operation which ordinarily caused sterilization.

"After these experiments, the synthetic reproduction of the substance was worked out and the soy bean was found to be the basic necessity of artificial creation. This resulted in the isolation of the female hormone progestin, and on the basis of this discovery, the research was carried still further by Dr. Adolph Butenandt of Danzig [Germany], who announced that he had reached the point where the chemical formula of Progrestin could be stated.

"'Since the hormone plays such an important part in the reproduction, it will probably be found useful in treating sundry disorders in the child-bearing organs of the female,' Dr. Allen said.

"The best form in which the soy bean can be obtained is in the Soy Wheat Macaroni, a scientifically balanced food."

Note: At the end of this article is a short piece stating that Roberts and his organization have campaigned for many years to promote the use of the "Whole Meal Loaf [whole-wheat bread] in the face of severe opposition from vested interests, that have endeavoured to push the claims of the White Loaf." "The F.G. Roberts National Health Organisation is gratified to learn to-day, November 4th, the Commonwealth Advisory Council on Nutrition, tabled [presented] its second report in the House of Representatives, stating that 'Whole Meal Bread is definitely *superior* to White Bread as a Staple Food.'"

383. *Nature's Path to Health (Melbourne, Australia).* 1936. Remarkable dietary properties of the soybean. Nov. 15. p. 8.
• ***Summary:*** Gives a brief history of the soybean and an overview of its nutritional benefits. "For 5,000 years the Soy Bean has replaced meat, eggs, and milk in the diet of millions of vegetarian Chinese. It has also been used for food in Japan, Indo-China, Siam and India. The Chinese make practically no use of dairy products, and use very little meat, yet they have lived for centuries in a state of prolific vigor on what appears to be a remarkably well-balanced diet by the use of the Soy Bean." Mentions soy bean flour and soy bean curd.

"Dresden, Germany–Dr. Ragnar Berg, famed city hospital food scientist, who wrote the Dictionary of Foods, recently conducted fundamental researches on protein requirements and found that Soy Beans are a splendid source of protein."

"Due to its content of lecithin and phosphorus, the Soy Bean is a nerve and brain food which is especially valuable in cases of neurasthenia for increasing nerve and brain energy."

384. *Argus (The) (Melbourne, Victoria, Australia).* 1936. Fire signals warn luggers. Dec. 31. p. 8.
• ***Summary:*** There have been reports of flagrant invasions of Australia's northern territorial waters by Japanese ships–such as those gathering pearls. And there is evidence: "Tobacco tins of a brand unobtainable in Australia, scattered tins of Japanese tinned goods, and soya bean sauce containers littered the beach."

Note: This is the earliest of 6 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "soya bean sauce."

385. Institut International d'Agriculture (International Institute of Agriculture). 1936. Le soja dans le monde [The soybean in the world]. Rome, Italy: Imprimerie de la Chambre des Deputes, Charles Colombo. viii + 282 p. Bibliography, p. 276-82. No index. 25 cm. [90 ref. Fre]
• ***Summary:*** A superb early work, containing extensive original information, looking at developments with soybeans and soyfoods country by country, worldwide. Contents. Preface (p. 1). A. Culture of soy *(soja;* p. 4): 1. Botanical description, selection, classification of the varieties. 2. Culture properly said. 3. Enemies and illnesses.

4. Culture in the various countries: 4a. The Americas (p. 38): Antigua, Argentina, Bermuda, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, USA (gives details on all varieties grown, and describes production, history, varieties, and cultural practices in North Carolina, Illinois, Indiana, Iowa, Maryland, Massachusetts, Mississippi, Missouri, New York, Ohio, West Virginia, Wisconsin, Conclusion), Guadeloupe, Guatemala, British Guiana, Dutch Guiana, British Honduras [Belize], Jamaica, Barbados, Martinique, Mexico, Montserrat, Peru, Puerto Rico, El Salvador, Trinidad and Tobago, Uruguay.

4b. Europe (p. 101): Germany, the Danubian countries, Austria, Spain, France, Great Britain, Hungary, Italy, Netherlands, Poland, Romania, Switzerland, Czechoslovakia, Turkey, USSR.

4c. Asia (p. 128): Ceylon, China and Manchuria, Cyprus, Federated States of Malaysia, British India (incl. Punjab, Bihar and Orissa, Burma, Berar, Madras Presidency, Bombay Presidency, Bengal (incl. Nepal, Bhutan, Sikkim, and the district of Darjeeling), Assam, North-West Frontier Province, United Provinces), Netherlands Indies, Indochina (incl. Tonkin, Annam, Laos, Cambodia, and Cochinchine), Japan, Palestine, Siam.

4d. Africa (p. 146): French West Africa, Algeria, Belgian Congo, Cyrenaica, Egypt, Eritrea, Madagascar, Morocco, Mauritius (Ile Maurice), Reunion (Réunion), Rhodesia, Anglo-Egyptian Sudan, Tripolitania, Tunisia, Union of South Africa.

4e. Oceania (p. 153): Australia, Fiji Islands, Hawaii, New Caledonia, New Zealand, Philippines.

B. Utilization of soya (p. 158): 1. The soybean in human nutrition and in industry: Whole soybeans, chart of the uses of whole soybeans, use of soya in the green state (green vegetable soybeans), soy sauce *(dau-tuong* of the Annamites, or *toyo,* named shoyu by the Japanese, or *chau-yau* or *chiang yoo* by the Chinese), condiments and sauces based on soya in the Netherlands Indies *(tempe, ontjom, tempemori* and *tempe kedele* [various types of tempeh and onchom, p. 168-70]), *tao tjo* [Indonesian-style miso], *tao dji* [soy nuggets], *ketjap, ketiap benteng* [Indonesian-style soy sauce], soymilk *(le lait de soja),* yuba *(crème de lait de soja),* tofu *(le fromage de soja)* and fermented tofu *(des fromages fermentés,* made by Li Yu-ying near Paris), soymilk casein *(caséine du lait de soja,* for industrial use, including vegetable albumin, or galalithe [galalith]" [isolated soy protein], and artificial wool), soy lecithin *(lécithine de soja),* soy flour *(la farine de soja,* incl. soy bread, soy pastries, and soy cocoa).

2. Soy oil (p. 194): Food uses, industrial uses (including soaps, products resembling petroleum, paints, varnishes, linoleum, and artificial rubber), extraction, directory of U.S. manufacturers of materials and equipment for soybean processing, directory of U.S. and Canadian manufacturers of food products based on soya *(produits alimentaires à base de soja,* p. 205-06), directory of U.S. manufacturers of industrial soy products (p. 206-07).

3. Soybean in the feeding of domestic animals (p. 207): Forage, hay, silage, pasture, soybean seeds, the minerals in soybeans, soya as a feed for dairy cows, cattle, buffaloes, sheep, hogs, horses and mules, poultry.

4. Use of soya as fertilizer (p. 257). C. The trade of soya and of its by-products (p. 363): Production of soybeans in the principal countries, economic importance of soybean culture in the USA, soybean trade/commerce including tables of the major importers and exporters, and amounts traded annually in 1931-1934, price of soybeans, cost of production.

List by region and country of people and organizations that responded to a questionnaire sent by IIA (p. 273-76). Bibliography of main publications consulted, listed by region and country of publication.

Reunion *(Ile de la Réunion):* "The soybean (Le Soja) is only cultivated as an experimental crop, on a few square meters at the agronomic station" (p. 148).

Fiji *(Iles Fidji):* Soybean cultivation is not yet practiced in this colony; however soybean seeds are currently being imported in order to conduct a trial.

New Caledonia: In 1928 soybean cultivation was introduced to New Caledonia.

Note 1. This is the earliest document seen (Dec. 2007) concerning soybeans in Bhutan, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Morocco, New Caledonia, Palestine, Peru, or Réunion, or the cultivation of soybeans in Bhutan, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Israel, Jamaica, Madagascar, Mexico, the Middle East, Morocco, New Caledonia, Palestine, Peru, or Réunion. It is also the earliest document seen (Dec. 2007) concerning soybeans in connection with (but not yet in) Cyprus; it is stated that soybeans are not grown on the island of Cyprus. Soybean culture is not practiced in the Italian colonies of Eritrea (Erythrée, now part of Ethiopia) or Cyrenaica (Cyrénaïque, now part of Libya).

Note 2. This document contains the earliest date seen (June 2007) for soybeans in Bhutan, New Caledonia, or Réunion, or the cultivation of soybeans in New Caledonia (1928), or Bhutan or Réunion (1936) (One of two documents).

Note 3. This is the earliest French-language document seen (Jun. 2000) that mentions tempeh, which it calls "tempe" (p. 168). It notes that, in general, the indigenous people of the Netherlands Indies use soybeans mainly to make *tempe,* a product which, throughout central and eastern Java, takes the place reserved for *ontjom* in western Java. Tempeh is found in two forms: either in large flat cakes which are cut at the time of sale into small square morsels, or wrapped in folded banana leaves. A detailed description of the preparation of each of these two types of tempeh is given as well as another type of tempe, called *tempemori,* which is made with soybeans and coconut presscake.

Soybean culture is not known to be practiced in the following countries or colonies: Antigua, Barbados, British Honduras (renamed Belize in about 1975), Trinidad and Tobago. Address: Rome, Italy.

386. Kale, F.S. 1936. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. Baroda State, India: F. Doctor & Co. xxxi + 375 p. Illust. Index. 22 cm. 2nd ed. 1937.

• ***Summary:*** Contents: Preface. 1. Deficiencies in the Indian diet and soya bean as a means to rectify them. 2. History of the origin and growth of soya bean. 3. The use of soya bean. 4. World trade in soya bean. 5. Botany of the soya bean plant. 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean. 9. Cultivation of soya bean in India. 10. The constituents of soya bean. 11. Soya bean milk. 12. Soya bean flour. 13. Industrial uses of soya bean. 14. Enriching soil by addition of nitrogen and use of soya bean as fodder. 15. Food requirement of the human body. 16. European and American soya bean recipes. 17. Diabetic dishes, Mahatma Gandhi's experiments at Magan Wadi and opinion of scientists on soya bean. 18. Chinese and Japanese soya bean dishes. 19. Indian soya bean dishes: Hindustani dishes, Moglai dishes, Gujarati dishes, Maharashtrian dishes, Bengali dishes, Goa dishes, Tanjore dishes. Appendix.

For a more detailed table of contents and summary of the work, see the 2nd edition (1937).

Note: This is the earliest English-language document seen (Sept. 2006) that uses the term "soya bean" in a new way–as a singular noun, like corn or wheat, not preceded by "the." Examples: "2. History of the origin and growth of soya bean. 3. The use of soya bean. 4. World trade in soya bean... 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean." This usage originated in developing countries. Address: Food Survey Officer, Baroda State, India.

387. Sampson, Hugh Charles. 1936. Cultivated crop plants of the British Empire and the Anglo-Egyptian Sudan (topical and sub-tropical): Based on information which has been supplied by the Departments of Agriculture concerned. *Kew Bulletin of Miscellaneous Information, Additional Series* XII. vii + 251 p. See p. 85, 201. (London: H.M. Stationery Office). [5 ref]

• ***Summary:*** "The information furnished in this Inventory of Cultivated Crop Plants, which was asked for by the Conference of Colonial Directors of Agriculture held in 1931, is based on the replies to a questionnaire issued by the Director of the Royal Botanic Gardens, Kew, and forwarded by the several Departments of State concerned to all Tropical and Sub- Tropical countries of the British Empire and to the Anglo-Egyptian Sudan. A copy of this questionnaire, together with the explanatory notes and covering letter, is printed as Appendix B to this publication. The information thus furnished has of necessity had to be condensed. There may be, and probably are, numerous errors. The officers who have made these returns may not in some cases have had the necessary facilities to enable them definitely to determine the species of the plant referred to, nor have they always the knowledge requisite for the task."

"Where the actual date of an introduction, and the country from which the plant was introduced are known, these are shown in brackets after the name of the country concerned."

A major part of the book is titled "List of Cultivated Crop Plants," arranged by Genus name. Pages 85-86 discuss Glycine Linn. Leguminosae.

Glycine javanica Linn. Tropical Africa and Asia. 'Rhodesian Kudzu Vine.' A fodder plant. An indigenous or early introduction in Southern Rhodesia. Note 1. This is the earliest document seen (Aug. 2003) that uses the name "Rhodesian Kudzu Vine."

Glycine max (Linn.) Merr. Known as "Gari kalai" in Bengal, "Pe-ngapi" in Burma, "Vilayati Chowra" in Sind, and "Kachang sapon" in Malay. "There appear to be two types; the northern type whose seeds are rounded in shape and often light colored and which grow on an erect plant, and the more tropical type which has a flattened seed, often dark colored, on a plant with a definite trailing habit.

(a) Indigenous or an early introduction in Burma, Sarawak [joined Malaysia in 1963], and the United Provinces [became a state of India, Uttar Pradesh, in 1947].

(b) Successfully introduced in Assam, Bahamas, Bengal (many varieties), Bihar & Orissa, Fiji, Hyderabad, North-West Frontier [became part of Pakistan in 1947], Queensland, South Africa, Southern Rhodesia, S.S. & F.M.S. [Straits Settlements & Federated Malay States; later Singapore and Malaysia] (by Chinese), Uganda (occasionally), W. Australia (occasionally). Note 2. This is the earliest document seen (Jan. 2000) that clearly refers to soybeans in Southern Rhodesia or the cultivation of soybeans in Southern Rhodesia.

Note 3. This is the earliest document seen (March 2010) that clearly refers to soybeans in Fiji or the cultivation of soybeans in Fiji.

(c) Still under trial or established on an acclimatisation station in Baroda [India], Bermuda (as a green manure), Bombay, British Guiana [later renamed Guyana] (1905; Venezuela, 1913; Trinidad, 1927), Central Provinces [India], Cyprus, Grenada, Kenya, Madras, Mauritius, Mysore (2 varieties from Java are promising), New Guinea (black and white seeded kinds), Nigeria (from U.S.A. and Fiji), Northern Rhodesia, Nyasaland, Punjab, St. Kitts, St. Lucia (Trinidad, 1925), St. Vincent, Seychelles, Sind [became part of Pakistan in Aug. 1947; capital is Karachi], Anglo-Egyptian Sudan, Tanganyika Territory, Trinidad.

Note 4. The meaning of "St. Lucia (Trinidad, 1925)" is unclear. As of 2009, St. Lucia is an island nation, one of the Windward Islands, in the eastern Caribbean Sea. About 250 miles to its south is Trinidad and Tobago, a completely different, separate, and much larger island nation. Moreover, there is no city or town named "St. Lucia" on Trinidad and Tobago.

(d) Introduced, but the cultivation has subsequently disappeared or has been abandoned, in Basutoland (abandoned as the seed shatters badly), Ceylon, Dominica.

(e) Introduced but has failed to become established in Antigua, Gambia, Gold Coast [Ghana] (Russia, 1929), Montserrat, North Borneo, Palestine, Sierra Leone (S. Russia, 1913; Botanic Garden, Regent's Park, England, 1928).

Pages 201-04 give a detailed description of Glycine max including: Introduction, plant habit, leaves, flowers and fertilisation, fruit, seeds, conclusion.

Note 5. This is the earliest document seen (Aug. 2009) concerning soybeans in The Bahamas, Basutoland (later renamed Lesotho), Palestine, the Seychelles, or Saint Vincent and the Grenadines, or the cultivation of soybeans in The Bahamas, Basutoland, Palestine, the Seychelles, or Saint Vincent and the Grenadines. This document contains the earliest date seen for soybeans in the Bahamas, Basutoland, the Seychelles, or Saint Vincent and the Grenadines, or the cultivation of soybeans in The Bahamas, Basutoland, the Seychelles, or Saint Vincent and the Grenadines (1936 or before). The source of these soybeans is unknown.

Note 6. This is the earliest document seen (Dec. 2007) concerning soybeans in Cyprus, or the cultivation of soybeans in Cyprus. This document contains the earliest date seen for soybeans in Cyprus, or the cultivation of soybeans in Cyprus (1936). The source of these soybeans is unknown. However another document published the same year contradicts this claim: Institut International d'Agriculture (International Institute of Agriculture). 1936. Le soja dans le monde [The soybean in the world] (which see). Unfortunately, Sampson gives no details about the soybeans said to be cultivated in each country.

Note 7. This document contains the earliest date seen for soybeans in Guyana, or the cultivation of soybeans in Guyana (1905). The source of these soybeans is unknown.

Note 8. This is the earliest document seen (March 2010) concerning soybeans in New Guinea, or the cultivation of soybeans in New Guinea. This document contains the earliest date seen for soybeans in New Guinea, or the cultivation of soybeans in New Guinea (1936 or before). However New Guinea is an island (the second largest in the world, after Greenland), which (as of 2007) is administratively divided into Western New Guinea, a province of Indonesia (formerly known as Irian Jaya and formerly part of the Dutch East Indies) on the West and the independent country of Papua New Guinea (formerly British New Guinea) on the east. Since this is an article about plants of the British Empire, the soybeans were almost certainly grown in what is today Papua New Guinea.

Note 9. This document contains the earliest clear date seen for soybeans in Sierra Leone, or the cultivation of soybeans in Sierra Leone (1913) (one of three documents). The source of these soybeans was probably South Russia via Great Britain.

Note 10. This is the earliest document seen (March 2006) that clearly refers to soybeans in Northern Rhodesia (later Zambia), or the cultivation of soybeans in Northern Rhodesia. This document contains the earliest clear date seen for soybeans in Northern Rhodesia, or the cultivation of soybeans in Northern Rhodesia (1936 or before). The source of these soybeans is unknown.

Note 11. This document contains the earliest date seen for soybeans in Venezuela, or the cultivation of soybeans in Venezuela (1913). The source of these soybeans is unknown. Soybeans were probably being cultivated in Venezuela in 1913, but we cannot be certain from this document.

In 1905, Jos. Burtt-Davy, government agrostologist and botanist in Transvaal, South Africa, notes (p. 261): "On January 1st Mr. H.C. Sampson, B.Sc., was transferred from the Education Department to be my assistant for Seed and Plant Introduction." Address: Economic Botanist, Royal Botanic Gardens, Kew; Indian Agricultural Service. Retired.

388. Irvine, Clarke. 1936? Health! With remedies and recipes: The book of the new race. Hollywood, California: Clarke Irvine. 78 p. Undated. No index. 18 cm. [1 ref]
• ***Summary:*** Filled with mostly wise and practical advice. On the title page of this 9th edition published in Hollywood we read: "Evolved from the author's original card 'Eleven Rules for Health,' published in 1924. First edition was three years in writing; printed in Auckland, New Zealand, 1927. In loving dedication to all little children; also to our dear mothers and fathers–they did the best they knew. No copyright; please credit. Published by the author in an effort to help suffering humanity." Facing the title page is a large portrait photo of "Skipper" Clarke Irvine. Above it: "Health is wealth." Below: "This book has helped you; buy another and pass it on."

Contents: Introduction. 1. Breathe. 2. Drink. 3. Sleep. 4. Eat (vegetarian natural foods, uncooked, in season, especially fresh fruits and juices). 5. Eliminate. 6. Exercise-work. 7. Play. 8. Think. 9. Improve. 10. Examine. 11. Love. Remedies. Recipes.

Concerning soy: "Soy bean milk is replacing animal milk" (p. 26). The last chapter, titled "Recipes," mentions" Soy milk (p. 75) recommended as a "nightcap" or drink before bedtime. Raw peanut butter (p. 76, 77). Garbanzas (p. 76). Soy or lima bread (p. 77). A liquefier helps to make delicious drinks (p. 77).

All editions are undated. An early edition is listed in the Jones Grain Mill Natural foods catalog, probably published in 1933 (p. 49). The 4th edition was the most recent on sale in Jan. 1937. The 7th edition was published in about 1945. The 9th edition is 78 pages and bears the extra subtitle "The book of the new race." It must have been published after Jan. 1935, the month that Otto Carque died (see p. 56).

Irvine, Clarke. 1964. Letter re: Irvine family genealogy to Myra, his only sister. May 5. He wrote "one little book which I've sold 10,000 on my own by mail,..."

Talk with Alice Marks Irvine, Clarke Irvine's wife. 2004. Feb. 23. Clarke wrote and began publishing this long before she met him, in 1941. It went into a 10th or 12th edition and was being sold during the 1940s and 1950s. One could probably determine when it was first published by looking through issues of *California Health News* from the 1930s. She does not have a copy. Address: Hollywood, California.

389. Roberts, F.G. 1936? Long life and how to attain it: The great law of nature explained. Put yourself in nature's hands. 2nd ed. Melbourne, Australia: Nature Cure Research Laboratories. 32 p. Undated. 22 cm. *
Address: Australia.

390. *Nature's Path to Health (Melbourne, Australia)*. 1937. Soy bean recipes. Jan/Feb. p. 11-12.
• ***Summary:*** "Soy Beans are among Nature's greatest gifts to mankind. It has constituted the chief source of protein food of hundreds of millions of Oriental people for over 4,000 years of recorded history and for centuries prior to that time. Soy Beans play a much greater role in the nutrition of these people than does wheat in our country. It was sown yearly with great ceremony by Emperors of China, and poets in the ages before the Christian Era

extolled the virtues of the Soy Bean in its services to humanity.

"Weight for weight the protein yield from Soy Bean is approximately twice that of meat, four times that of eggs and cereals, five times that of bread, and twelve times that of milk. As compared with meat, Soy Bean is free from ingredients which form uric acid It is an energy producing food and it is also one of the cheapest foods." Describes how to soak and pressure cook soy beans, and to mash them to make Soy Bean pulp.

Gives recipes for: Baked beans. Soy beans southern style (seasoned with a dash of Marmite). Baked soy bean croquettes (with 2 tablespoons copha [vegetable shortening] and 3 cups Soy Bean pulp, cooked and ground). Soy bean loaf. Soy bean vegetable soup. Soy loaf (with eggs). Soy bean souffle. Salad.

Note: A 4-page illustrated brochure titled "Curative Exercises," published at about this time, is by Mrs. G.M. Roberts–Osteopath, Dietitian, and Curative Exercise Expert. Associate Principal of–Roberts Health Academy. Head Office: 284 Post Office Place, Melbourne.

A large chart published by Roberts in the late 1930s, titled "Food Combination Chart," shows that he was interested in combining foods in what many naturopaths considered good and bad combinations. Thus, protein foods (incl. beans and nuts) were a bad combination with cooked fruit and acid fruit, and a fair combination with starch (such as bread, rice, cereal grains, and potatoes). Address: Australia.

391. *Nature's Path to Health (Melbourne, Australia).* 1937. Directory of health aids. Jan/Feb. p. 25.
• ***Summary:*** This is a directory of F.G. Roberts' health stores, services, and clinics in Melbourne, Ballarat, Geelong, Adelaide, Cessnock, Bundaberg, Newcastle, Sydney, Toowoomba, Brisbane, Rockhampton, and Maryborough. A nurse, osteopath, or "consulting practitioner" is in attendance at many locations.

Roberts describes his own work and headquarters as follows: "Victoria. Home of the Nature Cure Movement. 430 St. Kilda Rd., Melbourne. Phone: Win. 4206. Treatments in harmony with Nature. Curative Dietetics, Osteopathy, Chiropractic, Hydrotherapy, Spinal Diagnosis, Iridiagnosis, Urinalysis, Diathermy, and Blood Washing, etc. All the latest methods of natural treatment obtainable. Experienced and qualified nurses in attendance. Herbal Foods, Herbal Pills, and All Natural Remedies Obtainable. F.G. Roberts, N.D., Principal, assisted by G.M. [Gladys Maud] Roberts and Staff."

Also in Melbourne are located (1) the Elmsdale Guest House at 428 St. Kilda Road. "Under the personal supervision of Mr. and Mrs. F.G. Roberts." Phone: Win. 4606; (2) F.G.R.'s Health Food Products, 40a Chapel St., E. St. Kilda. (Note: In Aug/Sept. 1933 Mr. W.H. Willson, a nature cure dentist, had his offices at 40 Chapel St.); and (3) Joyce's Health and Dining Service. 300 Little Collins St.

Harold S. Grimes, N.D., is in attendance at the Sydney location. The Brisbane shop and clinic is "Now under F. E. Roberts. Jr., N.D., Supervisor. who cordially invites you to Free Consultations on all your Health Problems."

Examples of names of other organizations listed are: "Roberts Health Service Pty. Ltd." (Ballarat, Victoria). "Health Centre and Clinic" (Chessnock). "Natural Health Store" (Bundaberg, Queensland), "Health Food Store and Milk Bar" (East Street).

A similar but revised directory is published in the 1 Aug. 1938 issue of this magazine, p. 46. Address: Australia.

392. *Nature's Path to Health (Melbourne, Australia).* 1937. Lecture tours. Jan/Feb. p. 34.
• ***Summary:*** "An inspirational message will be brought to you by Muriel A. Ibbott (Health Lecturer and Naturopathic Consultant)." From Jan. 18 to Feb. 3 she will be lecturing in Toowoomba, Brisbane, Maryborough, Bundaberg, and Rockhampton.

"The Above Series will be followed by an Extraordinary Message by F.G. Roberts, N.D., D.O., 'Australia's Leading Naturopath and Pioneer'; World famed Lecturer and Teacher." From. Feb. 2 to March 6 he will be lecturing in Sydney, Newcastle, Toowoomba, Brisbane, Maryborough, Bundaberg, and Rockhampton.

"All F.G. Roberts' lectures illustrated by Gunn Slides" (9 Collins Place, Melbourne). Address: Australia.

393. *Nature's Path to Health (Melbourne, Australia).* 1937. F.G. Roberts Health Food Products. May/June. p. 20-22.
• ***Summary:*** On page 20, a full-page black-and-white photo shows the front of Roberts Health Service, a health food store at Geelong. There are many boxed and canned products in the two large front windows. On page 21 is a photo of the interior of the Geelong store. Paul Smith has photos of similar stores at Ballarat, Fremantle, and Toowoomba.

On page 22 a full-page photo shows a "View of our main factory and store." This is a fairly small but neat red brick factory, with delivery trucks parked at the side and front.

Note 1. This, factory was located at 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia. Roberts' original factory, it remained virtually unchanged until 1954.

The inside rear cover of this issue states: "F.G. Roberts, N.D., F.S.D., Australia's leading naturopath. 430 St. Kilda Rd., Melbourne."

Note 2. Other issues of this magazine published in 1937 show health food stores that are part of the Roberts Health Service: Rockhampton (Jan/Feb. p. 19), Maryborough

(March/April, p. 19), Newcastle "Health Academy" (March/April, p. 20). Address: Australia.

394. Ware, A.M. 1937. The soya bean. *J. of the Department of Agriculture of South Australia* 41(1):50-52. Aug. [1 ref]
• ***Summary:*** Harvesting and uses of the bean for food are briefly discussed. Experiments with the soya bean in the following states of Australia are summarized: South Australia (no departmental experiments could be traced), Western Australia, Victoria, Queensland, and New South Wales. Address: Wepowie.

395. *Nature's Path to Health (Melbourne, Australia).* 1937. Soy bean–The perfect protein. Sept/Oct. p. 34.
• ***Summary:*** "Packed into the tiny soya bean is a wealth of nutrition; minerals, tiny vitamins, easily assimilated carbohydrates, and the greatest hoard of proteins that any food in the vegetable kingdom contains. Think of it! A vegetable product equal to most, and superior to some animal products in proteins, the body building element in food, without which there would be no life. And this same Soya Bean, so rich in all the food essentials, produces an alkaline reaction in the body. It sounds almost unbelievable!

"The chief argument against a heavy meat diet is the acid reaction in the human system. So it is with all highly protein foods commonly used as meat substitutes–fish, eggs, etc.; but here is the most nearly perfect substitute for meat known to man, and it is one of the extremely rare foods which alkalinize the body."

"Milk and butter made from soya beans are richer and more satisfactory than dairy products. Its oil equals the best grade of olive oil."

"Lecithin, in which the soya bean is rich, is a nerve, brain, and sex building food. Calcium builds bone, teeth, finger nails and accessories.

"From the seed comes meal and oil. Out of the meal can be made a flour for use of infants, macaroni, breakfast foods, bread, cakes... From the dried beans come soya sauce, soups, roasted beans, vegetable, milk, liquid and powder, cheese, soy cultures that taste like buttermilk, beverages, confections and so-called candy.

"Another valuable property of the soy bean is its high alkalinity, which amounts to twenty-four times that of cow's milk. Concerning this point, Dr. Kellogg says: 'We are certainly eating too much meat and not enough alkaline products.' A meat diet is heavily charged with acids which lower the alkalinity of the blood and tissue fluids and tend to cause acidosis, thus inducing chronic fatigue, lowered resistance to disease, and setting up degenerative processes in the liver, kidneys, blood vessels and other parts of the body. More people die in this country from these causes than from any other." Address: Australia.

396. *Nature's Path to Health (Melbourne, Australia).* 1937. Advance naturopathy... Latest progress in America: Dr. Lust's school honoured. Sept/Oct. p. 14.
• ***Summary:*** "Naturopathy is here to stay, honoured by government recognition after seventeen years of public demand. This splendid achievement secures for the people of British Columbia [Canada] a Health Service with a Philosophy founded on Truth and worthy of the highest respect. Primarily interested in Causes and driving Disease out by the roots.

"At a Banquet in honour of the occasion the Dean of Arts of the University of British Columbia, Dr. Buchanan gave to the members their registered certificates."

"The Benedict Lust School of Naturopathy, New York, was the first school to be approved by the Board of Supervisors who were appointed by the Government from the University of British Columbia. Australia sends congratulations to Dr. Lust and his followers.

"The Naturopathic School of Dr. Benedict Lust conferred on F.G. Roberts, N.D., D.O., D.C. [doctor of naturopathy, osteopathy, and chiropractic], of 430 St. Kilda Road, Melbourne, Australia, the Degree of Dr. of Natural Therapeutics."

Update: Paul Smith of Soy Products of Australia Pty. Ltd. writes (1995 March 31): "I may have cleared up the Loma Linda honorary doctorate degree mystery. I have gone through issues of *Nature's Path to Health* [NPH] from July 1930 to Jan. 1947 very carefully. The only mention of an American degree appears on page 14 of the Sept/Oct. 1937 issue (copy enclosed). Dr. Benedict Lust, a monthly contributor to NPH, died in 1945. He visited Australia several times during the 1930s. Esmae, F.G. Roberts' granddaughter, was very young and it was more than 50 years ago when this degree was granted." "Unfortunately Roberts' files have been destroyed." Address: Australia.

397. *Nature's Path to Health (Melbourne, Australia).* 1937. Nutrition: Bernard Shaw, Gandhi, Henry Ford advocate soy beans and vegetarianism. Nov/Dec. p. 13-14.
• ***Summary:*** "In a recent visit to this country, Bernard Shaw was observed drinking a glass of milk. When questioned why he used milk, since he opposed exploitation of cows, Shaw replied that it was not cow's milk he used, but Soybean Milk. Bernard Shaw has been a vegetarian for a long time and has lately become interested in the Soybean.

"Gandhi becomes a champion of soybean–Abandoning his famous goat-milk, Gandhi, who is also a vegetarian, has become an advocate of soybean milk. Gandhi is a great believer in the soya bean. He thinks that soya milk will eventually replace the dairy product." A long article about the soya bean published in a recent issue of *Harijan* is quoted.

"Ford predicts vegetarian world. Dearborn, Michigan–Henry Ford, billionaire, automobile maker, has visioned a future world without ham sandwiches, juicy steaks, and chicken dinners, but with a worthy substitute produced by science from grains and vegetables... Ford is now 73 and is in excellent health."

"In a recent interview with newspaper men, Ford predicted: 'The farm animal will go, but the farm will become larger. The horse is dying out through the increased use of machines. The cow is losing its economic importance through the great advances in chemistry. The farmer of the future will grow vegetable foods instead of livestock.'

"According to Dr. Kellogg, a vegetarian diet is not new to Mr. Ford. For many years he has been practically a vegetarian. He owes to a vegetarian diet the health and vigor necessary to conduct successfully the gigantic industries his remarkable genius has created.

"Henry Ford, looking into the future, sees that the use of meat will have to be abandoned for economic reasons." Address: Australia.

398. *Nature's Path to Health (Melbourne, Australia).* 1937. The meetings of the natural health organisations. F.G. Roberts, N.D., founder and general president. Christmas.
• ***Summary:*** Tells when each of the eleven branches meets, its address, and officers. Melbourne branch, meets Australian Church Hall, 25 Russell Street, every Monday at 8 p.m. President, T.J. Tate; Secretary, H.S. Grimes, N.D., 430 St. Kilda Road, Melbourne, S.C.2.

Contains similar information for the branches at Geelong, Ballarat, Sydney, Newcastle, Brisbane, South East Essex, Maryborough, Bundaberg, Rockhampton, and Adelaide. Address: Australia.

399. *Nature's Path to Health (Melbourne, Australia).* 1937. The aims and objects of the F.G. Roberts Natural Health Organisation. Christmas.
• ***Summary:*** "1. To free humanity from the destructive influence of alcoholism, meat eating, tobacco habit, of drug poisoning, vaccination, surgical mutilation, vivisection, and other abuses practised in the name of science.

"2. To aim at returning to a natural way of living by the regulation of eating, drinking, breathing, bathing, dressing, working, resting and thinking; and establishing sexual and social relations on a normal and natural basis.

"3. To teach that the primary cause of disease is the violation of Nature's Laws, and that Nature Cure is a system of man building in harmony with the constructive principles in Nature on the physical and moral plane of being.

"4. To teach that Naturopathy presents man with the master key to all higher development on the mental, moral, and spiritual plane of being, and self-control of the physical body.

"5. To teach that Naturopathy selects and combines everything that is good in Dietetic Treatment, Hydrotherapy, Massage, Osteopathy, Chiropractic, Curative Gymnastics, and in Magnetic and Mental Therapeutics.

"6. Our Field.–The Universe is our school, Humanity out Text Book, and Nature our Instructor.

"7. Our Creed.–We believe in the ultimate triumph of Truth over Error, or Harmony over Discord, of Love over Hate, of Purity over Vice, of Smiles over Tears, of Life over Darkness, of Life over Death."

Note: An undated leaflet (from about 1937) with almost the same title ("The aims and objects of Australia's National Health Organization") has ten aims and objectives; it adds: "4. By joining the Natural Health Club of your own city you are not only able to exchange with others your ideas and experiences but you enjoy benefits that repay many times the nominal membership fee.

"5. In Melbourne, club meetings are held every Tuesday evening at 8 p.m., at The Athenaeum Art Gallery Hall, 188 Collins Street, next to the Town Hall. This weekly programme consists of bright, uplifting community singing, guest speaker, social items, questions and discussion, friendly free health guidance, physical culture and dietetic demonstrations." Address: Australia.

400. **Product Name:** Soy-Bev (Tea or Coffee Substitute).
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 48 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1937. December.
Ingredients: Incl. roasted and ground soybeans, chicory.
Wt/Vol., Packaging, Price: Canned.
New Product–Documentation: Ads in *Nature's Path to Health (Melbourne, Australia).* 1937. Nov/Dec. p. 15 and 27. "A Delicious Beverage to take the place of Tea or Coffee. Made from the best Soya Beans. An F.G.R's Health Food Product." The address is given as 48 Chapel St., St. Kilda, Melbourne. But it is not clear what kind of facility was located at this address.

Ad in *Nature's Path to Health.* 1937. Christmas issue. p. 34. "Soy-Bev. The national nightcap. A Delicious Beverage to take the place of Tea or Coffee. Invigorating. Health giving. Blood purifying. Fortifies the system. A sure thing against insomnia. Made by F.G. Roberts & Sons. In the Health Food Factory. 48 Chapel St., St. Kilda, Melbourne. At all Health Centres. The new health beverage that everybody is drinking." See also smaller ad on p. 19.

Ad in *Nature's Path to Health.* 1938. Aug. 1. p. 40. "Soy-Bev. The ideal night-cap. Why upset your system by taking tea or coffee?" Made at 48 Chapel St., St. Kilda, Melbourne. An illustration shows a man and woman seated in chairs by their fireplace each enjoying a cup of Soy-Bev. Below this is a steaming cup of Soy-Bev–which looks like coffee.

Ad in *Nature's Path to Health.* 1946. Aug/Sept. p. 23. "Your best moment. When the drink is Soy-Bev or Soya-Choc. These are the nicest drinks. Freshly made from the choicest soya beans in our modern factory, St. Kilda, Melbourne. In Hygienic ½ lb. and 1 lb. Tins at all Health Centres Throughout Australia." This ad also appeared in the April/May 1949 issue (p. 8) of this magazine.

Note from Paul Smith of Soy Products of Australia (Pte.) Ltd. 1995. March 14. Paul thinks Soy-Bev was first introduced in about 1936-36. It was made with roasted soybeans and chicory, The product was discontinued in 1973.

401. **Product Name:** Soy Flakes.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1937. December.
Ingredients: Soybeans.
How Stored: Shelf stable.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1937. Nov/Dec. p. 15. "Cooking eliminated! Now we have–Soy Flakes. The greatest things ever placed before health reformers. Gives to busy housewives the best food product ready to use. Soy bean has been welcomed by all vegetarians. Worry of preparation, waste of gas, labour in preparing. Soy-flakes large flakes of specially-prepared soy beans." Another ad is found in the Christmas 1937 issue, p. 12.

402. Kale, F.S. 1937. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. 2nd ed. Baroda State, India: Baroda State Press. xxx + 375 p. Illust. (35 leaves of plates, described in a separate record). Index. 22 cm. 2nd ed. 1937. [66 ref]

• ***Summary:*** Contents: 1. Deficiencies in the Indian diet and soya bean as a means to rectify them. 2. History of the origin and growth of soya bean: Derivation of the word soya bean, origin of soya bean, literature, primitive man and soya bean, name of the plant, home of soya bean and its expansion, varieties of soya bean, the culture of soya bean is very remote (It "has been the chief article of diet in China for over 7,000 years."), reference of soya bean in old Chinese records, how and when soya bean became known to Europeans, soya bean in England (from 1890; J.L. North and Henry Ford), soya bean in France (from 1739), soya bean in Italy, soya bean in other countries of Europe, soya bean in United States of America, India and soya bean.

3. The use of soya bean: Importance of soya bean, dietetic importance, industrial importance, agricultural importance (Russia, Mussolini in Italy), medical importance, soya bean is alkalising in its effect ("Soya bean milk as well as its flour is used in foods for invalids and infants, like Nestle's food"), longevity and soya bean.

4. World trade in soya bean: Imports to Europe, production of soya bean in Manchuria (58% in North Manchuria), exports from Manchuria, oil and cake industry in Manchuria, soya bean production in Japan, in America, in Africa, in Australia, in Europe, in Java, in India, in other British possessions, estimate of world production of the soya bean, the desirability of the expansion of soya bean cultivation, imports and exports of soybeans, soya bean oil, and soya cake–1913-1927: Denmark, Holland, United States, Great Britain, Japan, France, Russia, China, Germany, Norway, Korea. Source: International Institute of Agriculture, Bureau of Statistics, 1921, p. 420-21. A table (p. 38) shows statistics for world production of soybeans "as estimated by the leading firm of London soya bean dealers" for various years from 1923 to 1929. This includes individual statistics each year for China [incl. Manchuria], Japan, and USA. The world totals in tons are: 3,095,000 (for 1923-25). 3,397,000 (for 1926). 4,325,000 (for 1927). 6,000,000 (for 1928), and 6,570,000 (for 1929; incl. China 5,250,000; Japan 550,000; USA 250,000; Java & Dutch East Indies 120,000; Other Asiatic countries & Africa 400,000).

5. Botany of the soya bean plant. 6. Classification of soya bean. 7. Cultivation of soya bean. 8. Diseases and pests of soya bean. 9. Cultivation of soya bean in India. 10. The constituents of soya bean. 11. Soya bean milk. 12. Soya bean flour. 13. Industrial uses of soya bean. 14. Enriching soil by addition of nitrogen and use of soya bean as fodder. 15. Food requirement of the human body. 16. European and American soya bean recipes. 17. Diabetic dishes, Mahatma Gandhi's experiments at Magan Wadi and opinion of scientists on soya bean. 18. Chinese and Japanese soya bean dishes: Toffu [tofu] or soya bean curd: Digestibility, utilization, toffu khan, toffu nao, tze toffu (fried bean curd), chien chang toffu (thousand folds), hsiang khan, kori toffu (frozen toffu), preservation of toffu. Natto. Tokio natto and Kyoto natto etc. Hamanan natto [Hamanatto]. Yuba. Misso [miso]. Soya sauce. Soya bean confectionery. Roasted beans (Chinese).

19. Indian soya bean dishes: Hindustani dishes, Moglai dishes, Gujarati dishes, Maharashtrian dishes, Bengali dishes, Goa dishes, Tanjore dishes. Appendixes. 1. Acreage of soya bean in Manchuria during the last 5 years. 2. Total figures of export during last 5 years. 3. Bibliography. 4. Some opinions about the first edition of this book.

The preface begins: "This little book is written in response to innumerable inquiries I have had from time to time after the inauguration of the plantation ceremony of Soya Beans at the State Agricultural Experimental Station by H.H. the Maharaja Gaekwar of Baroda in November 1933.

"A few months after this a food exhibition was held in Baroda where many Soya Bean dishes–Indian, European and Chinese–were exhibited. The leading papers and journals all over the country spoke in very glowing terms about the Soya Bean dishes that were exhibited... Later on at the request of Messrs. Mitsui Bussan Kaisha Ltd., a leading Japanese Firm in Bombay, a Soya Bean Exhibition and Restaurant were run in the Japanese village at the H.O.H. fete. So keen was the interest and enthusiasm evinced by the cosmopolitan public of Bombay that seats in the restaurant had to be reserved in advance. The presence of H.E. the Governor and Lady Brabourne and many Indian princes was an additional evidence of the ever growing popularity of the tasty Soya Bean dishes served there.

"At the closing of the H.O.H. fete many prominent people of Bombay requested me to continue the restaurant at a convenient place in the city, and asked me to open soya-bean milk centres for the children of the poor who could not afford to buy cow's milk. Many were ready to finance any scheme that I would propose, but unfortunately my time was not my own as I had to attend to my duties in the State and could not take advantage of their generous offer.

"The Departments of Agriculture of the various provinces of India as well as many Indian States asked me to supply them with literature regarding the cultivation and the uses of this most useful bean. The Department of Commerce and Industry of the Government of Bombay inquired if I could furnish them with information about the machinery for the extraction of Soya-bean milk. Letters of inquiries from private individuals kept pouring in daily from all parts of India. All this has induced me to undertake the preparation and the publication of this book...

"From the number of experiments carried on in the Baroda territories and outside it, I feel sure that the Indian soil is most suitable for the cultivation of soya bean...

"The leading thought of the day in India is, 'Village uplift,' and 'Rural reconstruction.'

"Baroda, 7th January 1936, F.S.K.

"Preface to the Second Edition: I feel grateful to the public for having given such a hearty reception to the first edition of my book. It is running into a second edition within a year...

"Now, Soya Bean Bakeries and Restaurants have been started in the city of Bombay and in many other towns in India, and Soya Bean products are exhibited in almost all the exhibitions...

"I feel highly thankful to His Highness the Maharaja of Baroda who gave me an opportunity last year of visiting Russia, where I have seen that seven to ten per cent. of Soya Bean flour was being added to the wheat flour in order to enhance the nutritive value of the bread. The Soya Research Institute at Moscow is making researches into the nutritive, industrial and economical values of Soya Bean. I have seen there the actual working of the Soya-bean milk extracting plant. They make casein out of Soya-bean milk. Soya-bean cream is sold in the market.

"I visited the dietetic clinics in England, France, Germany, Austria and other European countries, where doctors prescribe Soya Bean bread for diabetic patients. In Russia, rickets and consumption are treated by Soyolk extracted out of Soya Bean...

"France is growing Soya Bean on côlt de jura [sic, Côte d'Azur, on the Mediterranean?]. In England, through the efforts of Mr. J.L. North, Soya Bean is realised as a field crop for the last two years.

"Paris, 3rd April 1937 (p. ix)." Address: Food Survey Officer, Baroda State, India.

403. Kale, F.S. 1937. Soya bean: Its value in dietetics, cultivation and uses. With 300 recipes. 2nd ed. Photos and illustrations (Continued–Document part II). Baroda State, India: Baroda State Press. xxx + 375 p. Illust. (35 leaves of plates). 22 cm. 2nd ed. 1937. [66 ref]

• ***Summary:*** Photos (mostly original) show: (1) "H.H. the Maharaja Gaekwar of Baroda the first Indian Ruler to inaugurate the soya bean plantation ceremony in his State 24th November 1933" (frontispiece, facing the title page). (2) "Dedicated to my noble master, His Highness the Maharajah Sir Sayajirao Gaekwar, G.C.S.I., G.C.I.E., Farzande-Khas-e- Daulate-Englishia (p. 1). (3) Soya bean ready for shipment at port Dairen, South Manchuria (p. 28). (4) View of Dairen harbour with bags of soya bean ready for shipment (p. 30). (5) Transport of soya beans [on sleds] on the frozen Liao-ho River near New-chwang [Newchwang, later Yingkou], North Manchuria (p. 31). (6) The Maharaja of Baroda seated in a chair, lecturing on the dietetic and industrial importance of soya bean (p. 37). (7) The Indian method of interculturing; two bullocks in a field (p. 80). (8) Bavabhai B. Patel, 65-year-old farmer interested in the cultivation of soya bean, in a field of soya beans with two bullocks (p. 82). (9) A field of soya beans grown [in 1934 or 1935] by Hargovan Bavabhai Patel, of Achisara, Taluka Sinor, Baroda District; he has been awarded the first prize for his good cultivation (p. 84). (10) A soya bean plant having more than 500 pods, fodder type variety grown at the Agricultural Experiment Station, Baroda (p. 86). (11) Poona fodder type green variety grown at the Agricultural Experiment Station, Baroda (p. 89). (12) Bags of soya bean seeds grown as Baroda State crop of 1935 (p. 91). (13) The luxuriant growth of the fodder type variety at the Baroda Agricultural Experiment Station (p. 103). (14) "The biggest soya bean milk factory at Moscow (Russia)." Four small photos show the plant at work, "Milking the earth" (p. 138). (15) "The author's own child 3 months' old fed on soya bean milk" (p. 144). (16) "Soya bean oil pressing mill worked by hydraulic power" (p. 158). (17) The Palace Bakery–"The first soya bean Bakery in India" (p. 196). (18) "Mahatma Gandhi who uses soya bean at Maganwadi" (p.

251). (19) Many people seated at tables in the "Soya Bean Preparation Restaurant" at the H.O.H. Fete, Bombay (p. 278). (20) Many Indian men standing at the "Soya Bean Restaurant at the Rural Life Exhibition, Baroda, on the occasion of H.H.'s Diamond Jubilee, 7 Jan. 1936 (p. 332).

Illustrations show: (1) "Shen-Nung. The Chinese emperor 2838 B.C. called 'the heavenly farmer.' He used to plant Soya bean every year with great ceremony" (p. 17). (2) A plant with branches showing the various ways in which the soya bean plants and seeds are used (p. 23). (3) Cartoon (from the American Medical Assoc. cartoon series) of a skeleton raising a glass of milk in one hand; he is standing behind a table on which is a bowl labeled "impure milk." The caption: "'I drink to the death of the whole table'–the dangers of contaminated milk" (p. 132). Address: Paris, France; Formerly: Food Survey Officer, Baroda State, India.

404. Kerle, Walter Douglas. 1937. Soybeans. Sydney, Australia: Dept. of Agriculture. 8 p. Illust. 25 cm. *
• ***Summary:*** Discusses the soybean in New South Wales.

405. Morse, W.J.; Cartter, J.L. 1937. Improvement in soybeans: Appendix 1–Workers identified with soybean improvement in the United States and abroad (Document part). *Yearbook of Agriculture (USDA)* p. 1154-89. For the year 1937. See p. 1184-85.
• ***Summary:*** In the United States: (1) USDA Bureau of Plant Industry, Division of Forage Crops and Diseases: W.J. Morse, Washington, DC. W.M. Stuart, Jr., and C.H. Brinkley, Arlington Experimental Farm, Arlington, Virginia. J.L. Cartter, Urbana, Illinois. M.G. Weiss, Ames, Iowa. J.L. Stephens, Tifton, Georgia. T.F. Akers, West Point, Mississippi. R.E. Stitt, Statesville, North Carolina. H.A. Schoth, Corvallis, Oregon.

(2) State agricultural experiment stations (32): Alabama, Auburn: H.B. Tisdale. Arkansas, Fayetteville: C.K. McClelland. Stuttgart: G.C. Banks. California, Berkeley: W.W. Mackie. Colorado, Fort Collins: D.W. Robertson, A. Kezer. Delaware, Newark: G.L. Schuster. Florida, Gainesville: G.E. Ritchey. Belle Glade: A. Daane. Quincy: J.D. Warner. Georgia, Athens: J.R. Fain. Experiment: R.P. Bledsoe. Illinois, Urbana: C.M. Woodworth, W.L. Burlison, J.C. Hackleman, L. F. Williams. Indiana, La Fayette: G.H. Cutler, R.R. Mulvey, K.E. Beeson, A.H. Probst. Iowa, Ames: H.D. Hughes, J.B. Wentz. Kansas, Manhattan: J.W. Zahnley. Kentucky, Lexington: E.J. Kinney. Louisiana, Baton Rouge: J.P. Gray. Maryland, College Park: J.E. Metzger, R.G. Rothgeb. Michigan, East Lansing: C.R. Megee. Minnesota, St. Paul: A.C. Arny, W.M. Myers.

Mississippi, State College: W.R. Perkins, J.F. O'Kelly. Stoneville: H.A. York. Poplarville: J.C. Robert. Missouri, Columbia: W.C. Etheridge, C.A. Helm, B.M. King. New Hampshire, Durham: F.S. Prince. New Jersey, New Brunswick: H.B. Sprague. New York, Ithaca: R.G. Wiggans. North Carolina, Raleigh: C.B. Williams, R.L. Lovvorn. North Dakota, Fargo: A.F. Yeager. Ohio, Columbus: J.B. Park, P. Preston. Wooster: L.E. Thatcher. Oklahoma, Stillwater: B.F. Kiltz. Pennsylvania, State College: C.F. Noll, C.E. Myers. South Carolina, Florence: E.E. Hall. Tennessee, Knoxville: H.P. Ogden. Texas, College Station: E.B. Reynolds. Virginia, Blacksburg: M.S. Kipps. Williamsburg: R.P. Cocke. West Virginia, Morgantown: J.A. Rigney. Wisconsin, Green Bay: E.J. Delwiche. Madison: G.M. Briggs, B.D. Leith.

Foreign countries (6):

Australia (4): Department of Agriculture, New South Wales: Glenn Innes, S.L. Macindoe. Traftor: W.H. Darragh. Richmond: N.S. Shirlow. Sydney: H. Wenholz.

Canada (3, all in Ontario province): Central Experimental Farm, Ottawa: F. Dimmock. Dominion Experiment Station, Harrow: C.W. Owen. Agricultural College, Guelph: O. McConkey.

England (1): Royal Botanic Gardens, London: J.L. North.

Germany (3): Kaiser Wilhelm Institute, Manchberg: W. Rudorf. Südd. Soya-Institut, München: K. Baumeister. Soya-Institut, Mannheim: L. [Lene] Mueller.

Japan (Incl. Chosen/Korea) (6 stations): Imperial Agricultural Experiment Station, Tokyo: H. Terao. Hokkaido Imperial Agricultural Experiment Station, Kotoni: V. Fujine and T. Hoshino. Saitama Agricultural Experiment Station, Ageo: T. Hasegawa. Central Agricultural Experiment Station, Suigen (Chosen [Korea]): I. Nagai. Central Agricultural Experiment Branch Station, Shariin (Chosen [Korea]): Y. Takahashi. Akita Agricultural Experiment Station, Akita: K. Adachi.

Manchuria (6 workers at 3 South Manchuria Railway Agricultural Experiment Stations). Kungchuling: Y. Nakamoto, S. Tsuda, M. Ishikawa, and K. Adachi. Hsiungyocheng: K. Hisatake. Kaiyuan: S. Kofuku. Address: 1. Senior Agronomist; 2. Assoc. Agronomist. Both: Div. of Forage Crops and Diseases, Bureau of Plant Industry [USDA, Washington, DC].

406. Woertge, Karl Heinz. 1937. Entwicklung und weltwirtschaftliche Bedeutung der Sojabohnenerzeugung und -verarbeitung [Development and international economic significance of soybean production and processing]. Thesis, Friedrich Alexander University, Erlangen, Coburg, Germany. 119 p. 28 cm. [112 ref. Ger]
• ***Summary:*** Contents: Foreword. Part I: History and culture of the soybean. 1. History, natural requirements and technology of soybean production; chemical composition of the soybean. 2. Occurrence of the soybean and methods of production in various countries: Asia (Manchuria and China, Japan, Korea, Formosa, Dutch East Indies, other

Asian countries incl. British India, Cochin China, Ceylon), America, Europe (Southeast Europe, Austria, USSR, France, Italy, England, Poland, Switzerland, Czechoslovakia, Germany), Africa and Australia.

Part II. Scale and global economic significance of soybean production in the main producing areas. 1. General overview of world soybean production: Production for seeds, for fodders. 2. Scale of soybean production in the main producing areas: Asia (Manchuria, Japan, Korea, Formosa, Dutch East Indies [Java and Madura/Madoera]), America, Europe (Southeast Europe, USSR).

Part III. Development and global economic significance of soybean processing. 1. Soybean processing possibilities: A. Processing soybeans to make foods: Asia (general. methods used in China and Japan to make vegetable-type soybeans and salads, koji, soymilk, shoyu [soy sauce], miso, natto, tofu, methods used in the Dutch East Indies), Europe (general overview, preparation of soybean meal, soymilk, coffee- and chocolate substitutes). B. The soybean as an oilseed: General, methods of obtaining the oil (in Asia, Europe, USA), use of soy oil (as human food, other). C. Obtaining lecithin from the soybean. D. Use of soybean press-cake for livestock feed. E. Use of the soybean meal for fertilizer. 2. World trade in soybeans, soy oil and soybean cake/meal *(Sojakuchen/Sojaschrot):* World trade in soybeans (Manchuria, Asia, Europe, USA), world trade in soy oil, world trade in soybean meal.

Closing remarks: The state of the world soybean market with special consideration for the current German conditions. Appendixes and tables. Address: Nuerenberg, Germany.

407. George, S.E. 1938. New industries: The versatile soya bean. *Nature's Path to Health (Melbourne, Australia).* Oct. 1. p. 17, 38.

• ***Summary:*** Discusses utilization of soya beans throughout the world to make soya bean oil and meal, industrial products (glycerine, paints, soaps, linoleum, rubber substitute, printing inks, explosives, etc.), bean-milk, bean-curds or tofu, salted bean-curd (resembles Roquefort cheese), coffee substitutes (sold today in America and Europe), soya bean flour, and beef-like extracts for use in soups ("one of the most famous European brands of soup-cubes has a soya-bean base"). "Sacks of [soya] beans make excellent substitutes for sandbags [in wartime], as was proved in the recent Manchurian struggle. Buddhists in China use bean-curd [probably yuba], shaped in molds, to make many products that resemble animal products: fish with sauces, a whole chicken swimming in a golden chicken soup. A number of other products made from soya beans are listed. Discusses the work of the Ford Motor Co. with growing and using soybeans in England and the USA.

A cartoon shows a figure of "The Versatile Soya Bean" smiling and dancing with hands on hips.

Note 1. This is the earliest document seen (April 2003) that mentions a meat alternative which is described as an alternative to fish or seafood.

Note 2. This is the earliest English-language document seen (Feb. 2004) that uses the term " bean-curds" (with a space in front of the word "bean") to refer to tofu. Address: Australia.

408. Black, M.A.; Woodcock, J.W. 1938. Soya beans in New Zealand. Question of economic value examined. *New Zealand J. of Agriculture* 57(4):293-95. Oct. 20.

• ***Summary:*** "Both from a commercial and an agricultural point of view the growing of soya beans is not an economic proposition in this country." The article attempts to answer 3 questions: 1. For what purposes are soya beans grown in other countries? 2. For what purposes might they be grown in New Zealand? 3. What is the experience of growing soya beans in New Zealand? Concerning the latter, it is reasonably certain that, outside the maize-growing areas, satisfactory yields cannot be relied upon. Temperature is clearly the controlling factor. In Palmerston North in 1935-36 the average yield of the 6 best varieties was 35.1 bushels. The next year the average temperature dropped about 4 degrees and the yield dropped to 9.2 bushels of very low-grade seed.

For the past 3 seasons the Fields Division of the Department of Agriculture and the Agronomy Division of Plant Research Bureau have collaborated in 15 field trials with soya beans. The locations of the trials and descriptions of the plots are given. Two to three trials were conducted each year. In 1935-36 the best yields came from Early Yellow (45 bushels/acre) and OAC (42 bu/a); in 1936-37 from Henry Ford (20.9) and Manchu (Ottawa; 20.8); in 1937-38 from Early Yellow (41.2) and Mandarin (40.4 bu/acre). Address: 1. Crop Ecologist, Plant Research Bureau; 2. Crop Experimentalist, Dep. of Agriculture.

409. **Product Name:** Soya Beans in Tomato (In glass jar. Canned by June 1940. Renamed The Versatile Soyabean in Tomato Sauce by 1953).

Manufacturer's Name: Roberts (F.G.) Health Food Products.

Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.

Date of Introduction: 1938. October.

Ingredients: Incl. soya beans, tomatoes.

Wt/Vol., Packaging, Price: 12 oz jar. Canned by June 1940.

How Stored: Shelf stable; refrigerate after opening.

New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1938. Oct. Half-page ad. "For your health's sake, eat Soya Beans in Tomato. The Protein food with the high Vitamin content, prepared under Hygienic conditions, hermetically sealed by F.G.R. Health

Food Products (Registered), 40 Chapel Street, St. Kilda. Directions for use. Place jar in water and heat. To open, lever lid with coin. Obtainable from Roberts Health Centre, 284 Post Office Place, Melbourne, C.1. Phone: Central 3394." A photo shows the jar and label. At the bottom of the label is written: "Manufactured at 40a Chapel St., St. Kilda."

Ad in *Nature's Path to Health.* 1940. June. p. 26 "Just what you've waited for! Better health foods." An illustration (line drawing) shows the four canned products, with the Soy Bean & Tomato in the smallest can. Ad in NPH. 1940. July. p. 8. "Roberts' Better Nut Foods." An illustration (line drawing) shows the four canned products, with the Soy Bean & Tomato in the smallest can. Small ad in Aug. 1940 issue, p. 5. "Roberts' Soy Bean in Tomato." "Packed in a new style in tin in convenient sizes and sold at all Roberts' Health Food Shops throughout Australia."

Ad in *Nature's Path to Health.* 1940. Nov/Dec. p. 30. "Roberts' Soy Nut Recipes." Same line drawing as in July issue. "Supplies always available at the Roberts Health Food Shops Throughout Australia."

Letter (fax) from Paul Smith of Soy Products of Australia. 1995. March 14. From 1940 to 1954 these soybeans were contract canned outside the Roberts' plant. From 1954 to 1974 they were canned in house. The product had to be discontinued in 1974 due to falling sales, its high labor cost and low profitability, and the lack of capital to further automate the process. Long before 1954 the Sanitarium (Adventist) retail shops sold this product under the Roberts brand name. Sanitarium studied the product then introduced their own version of it as a logical extension of their extensive range of canned vegetarian "meat analog" type products. They had economies of scale which Soy Products of Australia lacked. As Sanitarium Sales increased, ours declined. Beans in Tomato were processed continuously from 1940 to 1974 by SPA and previously under the F.G. Roberts brand.

410. **Product Name:** Roberts' Soy Nut Roast.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1938. October.
Wt/Vol., Packaging, Price: Tin-plated steel can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1938. Oct. Rear cover (p. 50). A photo shows the label: "The ideal meat substitute. 10 ozs. Nett. Another Roberts 100% protective health food."

Note: The same page shows that Roberts also made a coconut ice cream named Robert's Cocoanut; it was apparently a non-dairy product.

411. Roberts, F.G. 1938. Naturopathy: Nature cure. *Nature's Path to Health (Melbourne, Australia).* Nov. 1. p. 12.
• ***Summary:*** A portrait photo shows F.G. Roberts, smiling and dressed in a bow tie. "Life is all law... All life, spiritual, mental and physical is as scientific and exact as chemistry and mathematics. Harmony through obedience is the keynote of all. When that is maintained on each plane of our being, gladly, faithfully maintained, then life is truly a song, one with the melodies of nature, one with the life of the birds, of the trees, of the grass and rain. All nature sings because it is obedient to the law within and in harmony with it. All law is alive..." Address: N.D., D.O., Australia.

412. Willson, W.H.J. 1938. W.H.J.W., Euroa, writes -. *Nature's Path to Health (Melbourne, Australia).* Nov. 1. p. 12, 16.
• ***Summary:*** This letter to Mr. and Mrs. Roberts begins: "My dear friends and fellow workers in the Master's Cause, in His Name I send you greetings. Many thanks for the copy of the new journal *[Nature's Path to Health]*... You are doing a great work, more than any Church."

"I must congratulate you on the appearance of the Health Magazine, I do like it in its new dress, but especially for the good matter it contains... I often think of the happy times I had with both of you when the Health Club was learning to walk, and I had the privilege of guiding it in the right path as far as my ability enabled me. For eight years (about) I was honoured with confidence..." After praising the Roberts for their many kindness to him, Willson closes: "Christian love to each of you, from your ever true and faithful comrade." Signed W.H.J. Willson. A photo shows Mr. Willson and his son.

Note: There are 3 or 4 small towns in Australia named Euroa. This is probably the one located in northern Victoria, near Wangaratta, about 130 miles northeast of Melbourne. Address: "Paradise," Kennedy Street, Euroa, Australia.

413. Keely, T. Southwell 1938. At sea in a Japanese pearling lugger: A white man describes the ceaseless hunt for shell on the Arafura seabed. *Argus (The) (Melbourne, Victoria, Australia).* Nov. 19. p. 8. The Argus Week-end magazine.
• ***Summary:*** "Give him a few sticks of wood, some scraps of meat, and a trifle of soya bean sauce and Kenzo could produce an appetizing meal." For the white guests, sliced raw fish was seasoned with the "inevitable soya sauce."

Note: This is the earliest of 4 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "soya sauce." Address: Darwin [Australia].

414. Northern Territory (Australia). 1938. Report on the administration of the Northern Territory,... 1937-38. Canberra, Australia: Government Printer. *
• ***Summary:*** In the Northern Territory of Australia, trials have been conducted at Darwin and Katherine, with a little

success. Further work in these areas is now being undertaken by the Council for Scientific and Industrial Research (CSIR).

415. Roberts, F.G. 1938? Health via nature: Healing with food. 1st ed. Melbourne, Australia: Roberts' Health Service. 32 p. Undated. Illust. Port. 21 cm. *
• ***Summary:*** This book is about naturopathy and diet therapy. The only advertisement is for Vita-elm as a product. Mentions the Roberts guest house at 428 St. Kilda Road and their head office at 430 St. Kilda Rd., Melbourne. The previous publications listed within it are: "Long Life and How to Obtain It" and "The Natural Health Cook Book." Address: Australia.

416. *Argus (The) (Melbourne, Victoria, Australia).*1939. Queries answered. March 11. p. 32.
• ***Summary:*** "A. A. M. (Gunbower) asks for a recipe for Worcestershire sauce.

"The following has been recommended:–Take ½lb. each of whole black pepper, whole ginger, eschalots, and garlic, two quarts of vinegar, one pint of Indian soy sauce, 1oz. of ground black pepper, ½oz of powdered mace, ½oz of bruised cloves. Put all the ingredients into an earthenware vessel, let them stand for two weeks closely covered, stir them every day with a wooden spoon. At the end of two weeks boil the mixture for 30 minutes. Strain through a fine sieve, bottle when cold and seal tightly. The Indian soy is a vegetable sauce, and if it is unobtainable mushroom ketchup might be tried instead."

Note: This is the most recent of 144 documents seen (Oct. 2009) in the Australian Newspapers database that contains the term "India Soy."

417. Grimes, Harold S. 1939. State news: Australia. *Naturopath and Herald of Health (New York City)* 44(5):143-48. May. See p. 147.
• ***Summary:*** "In dealing with legislation one must naturally go carefully as it is wiser to make one good step and accomplish something... We expect... that very shortly the business of legislation for Naturopaths in our State of New South Wales will be brought forward again.

"Unfortunately Mr. [F.G.] Roberts met with a very serious accident several days before Christmas, being knocked down by a truck while crossing a street in Brisbane. He was very badly knocked about, having had 6 ribs smashed from his spine and various other internal injuries. Several times his life was despaired. You can understand we have been passing through quite anxious days. The proof that Nature never fails has been realized and he has left the Hospital this week to rest and recuperate in the country in Queensland. We look forward to having him home in about a month's time quite well and restored again.

"The New Year always calls for greater ambitions and aspirations. Let us all look forward to the most successful and progressive year of Nature Cure throughout the world." Address: N.D., Australia.

418. Black, M.A. 1939. Soya beans. *New Zealand J. of Science and Technology* 21(1A):46a-60a. June. [23 ref]
• ***Summary:*** Contents: Introduction. Description. Chemical composition. Utilization: Human food, stock food, industrial uses (paint, soap, glue, plastics). Production: General, agriculture, effect of temperature on yield, vernalization, acclimatization, soils and manures, inoculation, seeding, cultivation, harvesting, storage, conclusion. Appendices: A. Soya-bean oil. B. Soya-bean varieties tested in New Zealand. C. Prices. D. Average analysis of soya beans grown in new Zealand.

"Summary: Under existing conditions the growing of soya beans in New Zealand cannot be recommended because–(1) The climate is generally unsuitable. (2) The potential market for human food is negligible. (3) There is no internal commercial market, and no possible export market in competition with the main soya-bean growing countries. (4) For stock feed other cheaper and more certain supplies of forage and concentrates are available."

"Widespread interest has been aroused from time to time in New Zealand by reports of the amazing variety of products derived from soya beans... As long ago as 1915 the Department of Agriculture conducted successful experiments on the growing of soya beans, but the crop has not found favour with New Zealand farmers... In Western countries the chief food use of soya-oil is in the manufacture of margarine... In New Zealand some 27,000 gallons of decoloured and deodorized oil are used annually by bakers for shortening, and for greasing baking tins. For the latter purpose it is of value because it does not change colour under baking temperatures... Curiously enough, there is a soya-milk factory in Denmark, a great dairying country. Note 1. This is the earliest English-language document seen (Oct. 2003) that contains the term "soya-milk."

Industrial uses: "The chief industrial uses of soya-bean oil are in paint, varnish, soaps, linoleum and oilcloth, and printing ink. In paints the essential disadvantage of soya-oil is that it is a poor-drying oil, especially in comparison with linseed, perilla, and tung oils. This drawback can to a large extent be overcome by the use of cobalt driers, which, however, considerably increase the cost of the paint. Promising blends are being obtained with blends of perilla and soya oil..."

Tables 5 and 7 shows the average and range in the number of days to maturity, and the yields (1935-1938) for 14 soybean varieties tested in three seasons, two at Palmerston North, three at Ruakura, in New Zealand. In table 7, they are listed in ascending order of days to maturity: Manitoba Brown (128 days), Wisconsin Black

(128), Cayuga (133), St. Annes (141), Mandarin, Manchu, O.A.C. 211, Black Eyebrow, Early Yellow, A.K. (Harrow), Henry Ford (a selection of A.K. grown at Ford's estate in England), Black Ontario, Laredo, Virginia (186 days). For each variety is given the days to maturity (average and range), yield in bushels per acre (average and range), and number of trials.

Appendix B lists the following 34 soya-bean varieties tested in New Zealand: A.K., Auburn, Biloxi, Bilton, Black Beauty, Black Eyebrow, Black Ontario, Cayuga, Chernie, Dixie, Early Brown, Early Yellow, Harbinsoy, Herman, Hollybrook, Illini, Ito San Laredo, Mammoth Yellow, Manchu, Mandarin, Manitoba Brown, Mikado, Morse, O.A.C. 211, Ogemaw, Otoxi, Sable, St. Annes, Tashing, Tokio, Virginia, White Non-shatter, Wisconsin Black. Of these, 13 selections were sent by Mr. N.P. Neal of Wisconsin, as being likely to suit New Zealand conditions. Also four English acclimatized varieties, known as Jap, C, J, and O, have been grown.

Note 2. This is the earliest English-language document seen (Sept. 2006) that contains the term "soya-oil." Address: Agronomy Div., Plant Research Bureau, Dep. of Scientific and Industrial Research, New Zealand.

419. *Brewer and Wine Merchant (The).* 1939. Brewing in Worcester. June. p. 48. [1 ref]

• ***Summary:*** "The Worcester *News and Times* recently contained a well produced industrial supplement, in which were described the many and varied industries of Worcester. One is apt to look upon Worcester merely as an old quiet cathedral city. It is true the cathedral was one of its principal charms..."

After a section on "Vinegar brewing in Worcester" comes a section titled "The Origin of Worcestershire Sauce" which quotes from the *News and Times:* "The origin of the firm is based like all romantic histories, on tradition. The great grandfather of the present managing director, Capt. J.A. Dyson Perrins, was in partnership with a brother in a chemist's shop at Evesham. On October, 1828, a split occurred for some unknown reason, and Mr. William Perrins went into business with Mr. John Wheeley Lea in the shop at present occupied by Mr. A.E. Coverdale in Broadstreet, Worcester.

"Here, it is supposed, one day Sir Marcus Sandys, who had held many offices out East, including that of Governor of Bengal, came in with the recipe of a certain sauce to be made up. The two partners worked on this recipe and in due course brought forth 'Lea & Perrins Worcestershire Sauce, made from the recipe of a nobleman in the Country.

"In 1897 Mr. C.W. Dyson Perrins built the present factory in Midland-road, and the whole business was transferred from Broad-street.

"In 1930 the firm was amalgamated [merged] with H.P. Sauce, but the two ventures were kept quite distinct. There is also a Lea & Perrins, Incorporated, in New York, and Lea & Perrins (Australia) Ltd., in Sydney."

Note: This is the earliest document seen (Jan. 2007) that uses the word "Bengal" in connection with Lea and Perrins' Worcestershire Sauce. It is also the earliest document published in England that mentions "Sandys" or "Sir Marcus Sandys" (Governor of Bengal) in connection with this sauce. Address: England.

420. Kerle, W.D. 1939. On the dairy farm: Leguminous crops for coastal dairy farms. They feed the cows and the soil. *Agricultural Gazette of New South Wales* 50(8):457-60. Aug.

• ***Summary:*** Contents: Introduction. To grow lucerne successfully. Red clover. Supplementing permanent pastures. Benefits to maize crop (yield of maize grown after legumes increases). Cowpeas. Soybeans. Peanuts, field peas, vetches.

The soybean, a summer-growing legume, grows remarkably well under coastal conditions in NSW. In recent years, their production has increased dramatically in the USA. Address: H.D.A. [Hawkesbury Diploma of Agriculture], Special Agricultural Instructor.

421. *Nature's Path to Health (Melbourne, Australia).* 1939. Mr. Roberts' Australian tour. Public lectures, consultations, class lectures. Aug. p. 13.

• ***Summary:*** Roberts was an ardent traveler and speaker. This issue shows him giving public lectures, consultations, and class lectures almost non-stop from July 27 to Sept. 16 in Adelaide, Perth, Adelaide, Melbourne, Sydney, Newcastle, Toowoomba, Brisbane, Maryborough, Bundaberg, and Rockhampton. Address: Australia.

422. Morse, W.J. 1939. Soybeans–The world around. *Proceedings of the American Soybean Assoc.* p. 39-44. 19th annual meeting. Held 11-12 Sept. at Madison, Wisconsin.

• ***Summary:*** Contents: Introduction. Asia: China, Manchoukuo [Manchuria], Chosen (Korea), Japan, Netherlands Indies [Indonesia], Philippine Islands. Europe. Rumania. North and South America. Africa. Australia.

In Europe, production is presently "confined largely to European Russia, Bulgaria, Yugoslavia, Czechoslovakia, and Rumania. In Europe as a whole, slightly more than 3 million bushels of seed were produced in 1938, 80 per cent of which was produced in Bulgaria, Rumania, and Yugoslavia. The largest increase has been in Rumania, due chiefly to the fact that Germany, by guaranteeing purchases, has given a certain stability to cultivation... Russian scientists have for the past several years carried on extensive experiments with the soybean. At the present time the principal areas of cultivation are the Ukraine and certain regions in northern Caucasus.

"Previous to the World War, Europe absorbed about 50 per cent of the exports of soybeans from Asiatic countries, the largest of the imports being taken by the United Kingdom, with Denmark and the Netherlands taking the remainder. In the post-war period [after World War I] important changes took place, Germany taking first place as an importer and other nations entering into the international trade in the bean and its products. At present Germany still holds first place as an importer of soybeans, followed by Denmark, England, Sweden, and the Netherlands. Among other countries that have increased their imports are France, Norway, Latvia, and Italy...

In South America, soybeans are at the experimental stage. "Successful results have been obtained in Cuba, Argentina, Brazil, Chile, and in some parts of Mexico."

"Africa: Extensive experiments have been conducted with the soybean in various parts of Africa for many years but as yet it is an unfamiliar crop to the majority of African farmers. It has been successfully cultivated in the upland, midland, and coast districts of Natal and throughout Gambia, Sierra Leone, Nigeria, and the Gold Coast Colony. In the cotton and corn growing districts of Belgian Congo the soybean has been grown successfully for forage and food purposes. Results in all cases, however, indicate that more and better varieties, and improved methods of culture and harvesting are essential before the soybean becomes a factor of much economic importance in African agriculture. The crop is advised more as a crop for domestic use than the European market. It is of interest to note that in 1938 nearly 4 million pounds of soybean meal were used in native rations in the mine compounds of South Africa.

"Australia: Successful results have been obtained with a few American varieties in Victoria and Queensland, but thus far efforts to establish the soybean as a commercial crop have been disappointing. At the present time, however, more extensive tests are being conducted to obtain adapted varieties in order to produce beans on a commercial scale."

A table (p. 43) gives "Acreage, production, and imports of soybeans by countries (Compiled from official sources)," based largely on 1938 statistics. The countries are: Austria, Belgo-Luxembourg [Belgium], British Malaya, Bulgaria, Canada, China, Chosen (Korea), Czechoslovakia, Denmark, Estonia, France, Germany, Hongkong, Italy, Japan, Kwantung, Latvia, Manchoukuo, Netherlands, Netherlands Indies, Norway, Poland-Danzig, Rumania, Sweden, Taiwan (Formosa), United Kingdom, United States, U.S.S.R. (Russia), Yugoslavia.

Leading soybean producers are: China 217,192,000 bushels (1936), Manchoukuo 170,269,000 bushels, United States 57,665,000 bushels, Chosen 18,480,000 bushels, Japan 13,473,000 bushels (1937), Netherlands Indies 9,873,000 bushels (production minus seed for planting), U.S.S.R. 2,502,000 bushels, Rumania 1,804,000 bushels.

Leading soybean importers include: Germany 28,766,356 bushels (the world's largest soybean importer), Japan 27,796,787 bushels (#2 worldwide), Estonia 195,475 bushels, Latvia 86,347 bushels, and Poland-Danzig 19,106 bushels.

Note: This is the earliest document seen (Feb. 2005) concerning soybeans in Estonia. This document contains the earliest date seen for soybeans in Estonia (1938). Address: USDA Bureau of Plant Industry, Washington, DC.

423. **Product Name:** Malto-Soy Drink (Tea or Coffee Substitute).
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1939. September.
Ingredients: Incl. roasted and ground soybeans, chicory.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1939. Sept. p. 20 and Oct. p. 13. "Malto-Soy Drink. The improved natural drink. Replace your tea and coffee with Malto-Soy Drink, the 100% Protective Drink. There is no better drink for your morning cup than Malto-Soy Drink. Ladies enjoy it for their afternoon refresher drink. Combine Malto-Soy Drink with wholemeal bread, Glumatose and cream. You will be delighted with the result.–Never be without Malto-Soy Drink. Obtainable at all F.G. Roberts' Health Food Stores."

Ad in *Nature's Path to Health.* 1940. Feb. p. 44. This ad for Malto-Soy Drink now uses the illustration formerly used with Soy-Bev. An illustration (line drawing) shows a man and woman seated in chairs by their fireplace each enjoying a cup of Malto-Soy Drink. Below this is a steaming cup of Malto-Soy Drink.

424. **Product Name:** Soy Milk Compound (Renamed Soy Compound in 1981).
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1939. September.
Ingredients: Incl. soybeans, lactose.
Wt/Vol., Packaging, Price: Tin-plated steel can.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1939. Sept. p. 27 and Oct. p. 13. "Soy Milk Compound. Contains natural lecithin and amino acids. This milk compound is a hormone building food and therefore can be used by children and adults with most beneficial results. Soy-Milk Compound is highly recommended for infant feeding. For those who cannot use cow's milk Soy-Milk Compound proves eminently satisfactory. Use Soy-Milk Compound daily either with hot or cold milk. Drink Soy-Milk Compound and strengthen the

brain by Lecithin contained in this Defensive Food. Obtainable at all F.G. Roberts' Health Food Stores. Addresses, Page 47." Same ad in the following 1940 issues: Feb. p. 38, March p. 30, April p. 16.

Information brochure sent by Paul Smith of Soy Products of Australia. 1995. March 10. "Soy Products of Australia Pty. Ltd. evolved from F.G. Roberts' interest in using soy as an alternative to milk in treating allergy problems, particularly in children. The soy component of Soy Compound [soy flour] was imported between the 1930s and 1950s. Since 1954 Roberts' soy flours and grits have been manufactured in Australia from Australian grow soybeans... Soy Compound was formulated in the early 1930s as a result of F.G. Roberts' combined interest in the work of Dr. Harry Willis Miller with soy milk and children in China, during the 1920s and 1930s, and in treating cow's milk allergy problems–eczema, colic, mucus and related infection problems–particularly in children... Lactose is used in Soy Compound because it is a valuable, naturally occurring, complex carbohydrate present in the milks of all suckling mammals from human beings to whales and dolphins."

Note from Paul Smith of Soy Products of Australia (Pte.) Ltd. 1995. March 14. Paul thinks Soy Milk Compound was first introduced in about 1933-34.

425. *Nature's Path to Health (Melbourne, Australia).* 1939. Coming! Coming! Advance news from the F.G. Roberts Institute of Naturopathy. Oct. p. 36.
• ***Summary:*** "During the last ten years an enormous amount of education has been undertaken throughout Australia by this institute, and many thousands have benefited by the work accomplished." The Institute is now preparing a new set of lessons which will allow practitioners to become a professional dietitian and practising naturopath. "These lessons will quite clearly define the disease to be dealt with giving diagnosis, pathology, symptoms and prognosis. The correct iris signs from the iris of the eye in accordance with the most advanced knowledge of iridiagnosis will be included."

"Full details await your request at the F.G. Roberts Institute of Naturopathy, 284 Post Office Place, Melbourne, C.1." Address: Australia.

426. Fricke, E.F. 1939. Soya beans: Recent Tasmanian trials. *Tasmanian J. of Agriculture* 10:197-98. Nov. 1. Also in Plant Science Literature 11(1):19 (1940).
• ***Summary:*** Over the last few years there have been numerous enquiries as to whether the Soya bean crop could be grown in Tasmania. "Some twenty-five years ago [i.e., in about 1914] attempts were made to introduce Soya beans by the Department of Agriculture, but without success. Since that time many new varieties have become available and we read of crops being successfully grown in England.

"In 1931 an attempt was made to grow the Mammoth Yellow variety by the Department, in co-operation with Mr. G.S. Parsons, in the Scottsdale district [of Tasmania]. The crop promised well in the early stages, but was later ruined by frost.

"The Van Diemen's Land company has been conducting experiments with Soya beans at Ridgley since 1935. The Company's Directors in London sent out in that year a bushel of seed grown on the Fordson Estates in Essex [England]." The results have been disappointing. Address: Agronomist.

427. Hennefrund, Helen E. comp. 1939. The peanut industry: A selected list of references on the economic aspects of the industry, 1920-1939. *USDA Bureau of Agricultural Economics, Agricultural Economics Bibliography* No. 80. viii + 238 p. Nov. 28 cm. [641 ref]
• ***Summary:*** This bibliography was compiled under the direction of Mary G. Lacy, librarian at the Bureau of Agricultural Economics. Contents: Foreword, by Mary Lacy. Sources consulted. General. United States: General, Agricultural Adjustment Program, cost of production and labor requirements, grading and standardization, legislation, markets and marketing, mechanization, periodicals, Philippine Islands, statistics, storage, utilization (general, feed and its nutritive value, peanut butter, peanut oil).

Foreign countries: General, Algeria, Argentina, Australia, Belgium and Belgian Congo, Brazil, British Empire, British East Africa, British West Africa, Bulgaria, Canada, Ceylon, China, Colombia, Cuba, Denmark, Egypt, France, French West Africa (incl. Senegal, French Guinea), Germany, India, Indo-China, Italy, Japan and Manchuria, Malaya, Mexico, Morocco, Netherlands and Dutch East Indies, Palestine, Poland, Portugal and Colonies, Rhodesia, South Africa, Spain, Sudan, Sweden, Thailand (Siam), Tunis [Tunisia], Turkey, Union of Soviet Socialist Republics, Uruguay, West Indies (British), Yugoslavia.

Pages 1-145 contain 641 bibliographic references (partially annotated), arranged by subject as shown above. Pages 146-238 are indexes.

The Foreword notes: "This bibliography supersedes and brings up to date a typewritten list by Vajen E. Hitz issued in 1931 entitled 'The peanut industry: Selected references on the economic aspects of the industry... 1920 to date.' It contains references to books, pamphlets, and periodical articles relating to the economic aspects of the peanut industry in the United States and in foreign countries from 1920 through the first five months of 1939... Call numbers following the citations are those of the U.S. Department of Agriculture Library, unless otherwise noted. 'Libr. Congr.' preceding a call number indicates that the publication is in the Library of Congress." Address: USDA Bureau of Agricultural Economics.

428. Morse, W.J.; Cartter, J.L. 1939. Soybeans: Culture and varieties. *USDA Farmers' Bulletin* No. 1520 (Revised ed.). 39 p. Nov. Revision of April 1927 edition, further revised in 1949.

• ***Summary:*** Contents: History. Description. Distribution and production. Climatic adaptations. Soil preferences. Varieties (classified by length of growing season into 7 groups, and divided within each group into "Seed, forage, green vegetable, and dry edible" types). Description of varieties (describes 125 varieties). Preparation of the seedbed. Fertilizers and lime. Inoculation. Time of seeding. Methods of seeding. Rate of seeding. Depth of seeding. Cultivation. Soybeans in rotations. Soybeans in mixtures. Soybeans drilled in small grains. Cost of production. Insect enemies of soybeans. Soybean diseases. Other enemies of soybeans.

"History: Ancient Chinese literature reveals that the soybean was extensively cultivated and highly valued as a food centuries before written records were kept. The first record of the plant is contained in a materia medica describing the plants of China, written by Emperor Sheng Nung in 2838 B.C. Methods of culture, varieties for different purposes, and numerous uses are repeatedly mentioned in later records, indicating the soybean to be of very ancient cultivation and perhaps one of the oldest crops grown by man. It was considered the most important cultivated legume and one of the five sacred grains essential to the existence of Chinese civilization. Soybean seed was sown yearly with great ceremony by the emperors of China, and poets through the ages have extolled the virtues of the plant in its services to humanity.

"The soybean was first made known to Europeans by Engelbert Kaempfer, a German botanist, who spent 2 years, 1691-92, in Japan. Seed sent by Chinese missionaries was planted as early as 1740 in botanic gardens in France..."

"Distribution and production: The soybean is grown to a greater extent in Manchuria than in any other country in the world. It occupies about 25 percent of the total cultivated area and is relied upon by the Manchurian farmer as a cash crop. China, Japan, and Chosen [Korea] are large producers and the soybean is cultivated more or less also in the Philippines, Siam, Cochin China, Netherland India [later Indonesia], and India. In other parts of the world, particularly Germany, England, Soviet Union, France, Italy, Czechoslovakia, Rumania, Mexico, Argentina, Cuba, Canada, New South Wales, New Zealand, Algeria, Egypt, British East Africa, South Africa, and Spain, various degrees of success have been obtained."

The section on diseases discusses the following: Purple spot of seeds, bacterial blight, bacterial pustule, mosaic, wilt, brown spot, sunburn or aphid injury, downy mildew, pod and stem blight, anthracnose, sclerotial stem rot, frog-eye spots, and *Pythium* root rot.

A table (p. 6-7) shows different varieties of soybeans recommended for four different uses (seed, forage, green vegetable, or dry edible), classified by the length of the growing season. Green vegetable–Very early (100 days or less): Agate. Sioux. Early (101 to 110 days): Bansei, Chusei, Goku, Kanro, Waseda. Medium early (111 to 120 days): Fuji, Hakote, Hiro, Hokkaido, Jogun, Kura, Osaya, Sato, Shiro, Sousei, Suru, Toku, Willomi. Medium (121 to 130 days): Chame, Funk Delicious, Imperial. Medium late (131 to 140 days): Aoda, Hahto, Higan, Rokusun. Late (141 to 160 days): Nanda.

Dry edible–Early (101 to 110 days): Bansei, Chusei, Goku, Kanro, Waseda. Medium early (111 to 120 days): Hokkaido, Jogun, Osaya, Sousei, Suru, Toku, Willomi. Medium (121 to 130 days): Funk Delicious, Imperial. Medium late (131 to 140 days): Easycook*, Haberlandt*, Higan, Rokusun, Tokyo*. Late (141 to 160 days): Nanda. Note: All dry edible varieties except three (Easycook, Haberlandt, and Tokyo–which are followed by an asterisk (*)) are also included in the green vegetable group. But many in the green vegetable group are not included in the dry edible group.

Detailed descriptions of the following 125 varieties are given (p. 7-17): Agate, A.K., Aksarben, Aoda, Arksoy, Avoyelles, Bansei, Barchet, Biloxi, Black Beauty (same as Ebony), Black Eyebrow, Cayuga, Chame, Charlee, Chernie, Chestnut, Chiquita, Chusei, Clemson, Columbia, Creole, Delnoshat, Delsta, Dixie, Dunfield, Early Green (same as Medium Green), Early Virginia Brown (same as Virginia), Early Wilson (same as Wilson), Early Wisconsin Black (same as Wisconsin Black), Early Yellow (same as Ito San), Easycook, Ebony, Elton, Fuji, Funk Delicious, George Washington, Georgian, Goku, Guelph (same as Medium Green), Habaro, Haberlandt, Hahto, Hakote, Harbinsoy, Hayseed, Herman, Higan, Hiro, Hokkaido, Hollybrook, Hongkong, Hoosier, Hurrelbrink, Illini, Ilsoy, Imperial, Indiana Hollybrook (same as Midwest), Ito San, Jogun, Kanro, Kingwa, Kura, Laredo, Large Brown (same as Mammoth Brown), Large Yellow (same as Mammoth Yellow), Late Yellow (same as Mammoth Yellow), Lexington, Macoupin, Mamloxi, Mammoth Brown, Mammoth Yellow, Mamredo, Manchu, Mandarin, Mandell, Mansoy, Medium Early Green (same as Medium Green), Medium Early Yellow (same as Ito San), Medium Green, Medium Yellow (same as Midwest), Midwest, Minsoy, Missoy, Monetta, Morse, Mukden, Nanda, Nanking, Norredo, Northern Hollybrook (same as Midwest), Ogemaw, Old Dominion, Oloxi (formerly Coker's Black Beauty), Osaya, Otootan, Ozark, Palmetto, Pee Dee (Coker's 31-15), Peking, Pine Dell Perfection, Pinpu, Richland, Rokusun, Sato, Scioto, Shiro, Sioux, Sooty, Sousei, Southern Green, Southern Prolific, Soysota, Suru, Tarheel Black, Toku, Tokyo, Virginia (selection {19186-D} from the Morse variety at Arlington Experiment Farm in

1907), Waseda, Wea, White Biloxi, Willomi, Wilson, Wilson-Five, Wisconsin Black, Woods' Yellow, Yelredo (a nonshattering selection, Coker's 319), Yokoten. Address: 1. Senior Agronomist; 2. Assoc. Agronomist, Div. of Forage Crops and Diseases; Both: USDA Bureau of Plant Industry, Washington, DC.

429. Northern Territory (Australia). 1939. Report on the administration of the Northern Territory.... 1938-39. Canberra, Australia: Government Printer. *
• ***Summary:*** In the Northern Territory of Australia, trials have been conducted at Darwin and Katherine, with a little success. Further work in these areas is now being undertaken by the Council for Scientific and Industrial Research (CSIR).

430. Matagrin, Am. 1939. Le soja et les industries du soja: Produits alimentaires, huile de soja, lécithine végétale, caséine végétale [Soya and soya industries: Food products, soy oil, vegetable lecithin, and vegetable casein]. Paris: Gauthier-Villars. x + 390 p. 18 cm. [300 ref. Fre]
• ***Summary:*** Contents: Introduction. 1. The agricultural, industrial, and commercial history of soya: Asiatic origins and propagation in Europe, soya in America (its cultivation and industries), soya in Europe, Asia, Africa, and Oceania (1936) (1. Admission of soya in the agriculture and industry of European nations (p. 35): Soya in France, soy industry and commerce in central and northern Europe {England, Germany, Holland, Denmark, Sweden, Poland, Austria and Hungary, Switzerland}, penetration of soya into southern Europe {Iberian peninsula, Italy, Balkan countries of Dalmatia, Istria, Yugoslavia, Greece (p. 47), Bulgaria, Romania, Ukraine}, the grandeur and decadence of soya in Russia. 2. Soya in modern Asia (p. 51): China and Manchuria, Japan, Korea, Formosa, French Indochina {Tonkin, Cambodia, Cochin China}, the British and Dutch Indies {Siam, Assam, Bengal, Burma, Ceylon, India, Straits Settlements [later Singapore] / Malacca}, western Asia {Turkestan, Persia (p. 57)}. 3. Soya in Africa and Australia (p. 57-58): South Africa, Rhodesia, Nigeria, Gold Coast [later Ghana], Cote d'Ivoire, Dahomey, Togo, Algeria, Tunisia, Morocco, Egypt, Australia {Queensland, New South Wales, Victoria}, Tasmania, New Zealand, not yet in British New Guinea [later Papua New Guinea], Philippines, Java).

2. The botany and agronomy of soya: The plant, its names, its botanical characteristics, its varieties (original and created by selection), the cultivation of soya. 3. The general chemistry of soya: Chemical composition of the plant, structure and chemical composition of the beans. 4. Using soya in soyfoods and soyfood products: Whole soybeans (fresh, dry, sprouted, roasted and salted *(Fève grillée, fève salée de soja, fèves de soja salées,* p. 166-67), soynut butter *(un mélange rappelant les beurres végétaux),* soy coffee, soy confections, soy chocolate, soy sprouts), soymilk and tofu *(le lait et le fromage de soja),* okara *(pulpe résiduaire de la préparation du lait de soja),* fermented soy products (solid, paste, and liquid condiments; natto, miso, and shoyu [soy sauce]; kiu-tsee and lactic ferments), soy flour and bread. 5. The soy oil industry and products derived from it: Extraction and refining of soy oil, properties and use of soy oil. 6. The vegetable lecithin industry: Extraction of vegetable lecithin, properties and use of vegetable lecithin. 7. The vegetable casein industries and plastic materials based on soya: Soybean cakes and flours from which the oil has been removed, use of such cakes and flours, in the crude state, as a raw material for plastics, manufacture and use of vegetable protein, soybean cellulose for artificial silk, soya furfural and furfuraldehyde (phenolic resins). Conclusion: How to launch soya industries in France. important terms:

Note 1. This is the earliest French-language document seen that uses the terms *Fève grillée, fève salée de soja,* or *fèves de soja salées,* "roasted soy beans" to refer to soynuts.

Note 2. This is the earliest French-language document seen (April 2005) that mentions soynut butter, which it calls *un mélange rappelant les beurres végétaux.* Address: France.

431. Matagrin, Am. 1939. Le soja et les industries du soja: Le soja en Afrique et en Australie [Soya and soya industries: Soya in Africa and Australia (Document part)]. Paris: Gauthier-Villars. x + 390 p. See p. 57-58. 18 cm. [Fre]
• ***Summary:*** There are no indigenous soybean varieties in Africa, but soybeans were introduced by the English to the Cape [South Africa]; then to the Orange Free Province, Rhodesia, and Transvaal, and also to Nigeria, the Gold Coast [later Ghana], and Côte d'Ivoire. Likewise, they were introduced by the French to Dahomey [later Benin] and Togo. Today soybeans seem to offer good promise everywhere, but production has been developed only in southern Africa. In northern Africa, earlier trials, which were rather indecisive due to the lack of selection and lack of human experience (except for those of Asian peoples), have been undertaken more seriously since 1918 in Algeria, then in Tunisia and then in Morocco; the coastal regions, where irrigation is unnecessary, seem more favorable.

Elsewhere, it is important to get early maturing varieties in order to avoid dehiscence of the pods under the influence of the summer heat. Note: Seedpods of some soybean varieties dehisce at maturity. That is, they split lengthwise along the natural line of the pod and discharge the contents of the pod–the soybean seeds.

The sandy and rocky soils, which are sometimes well tolerated by soybeans grown in the USA (North Carolina, etc.), are poorly suited in Algeria.

Following the advice of Mr. Rouest, we could try planting the seeds in two rows (20 to 25 cm apart), leaving between the two rows a space of about 1 meter of fallow (unplanted) land. In Tunisia, the climate and the vast territory offer advantages to many soybean varieties, and the trials which began in the 19th century, have now reached a certain amplitude / developed prosperously.

Note: Haberlandt (1878, p. 6) states that he obtained one green-seeded soybean from Tunis [later renamed Tunisia] in 1873 at the Vienna World Exposition *(Wiener Weltausstellung).*

In Morocco, where 35,000 to 50,000 tonnes per year of other beans *(d'autres fèves)* are produced, at least one-third of which is exported (including the bean of Safi, which reminds one of the horse bean or dry kidney bean *[féverole]* of Egypt), this crop succeeds in the regions that are rather cool zones or that allow irrigation. This crop could enrich the soils with nitrogen in the valley of Sebou and the area around Fez, the small market-garden valleys of Mogador, perhaps even on the plains or plateaus of the Chaouïa and of the Doukala [Doukkala; the latter two places are now both in Morocco].

As for Egypt, it has already been worked over by the English propaganda, and soy has spread in the valley of the Nile, beside the horse-beans *(féveroles)* which have an ancient reputation.

In Australia this Asian legume is finally being cultivated successfully. It began at the start of the 20th century in the southeast, and today it grows all along the eastern coast (Queensland, New South Wales, Victoria). From there it somehow spread a bit to Tasmania and toward Adelaide, and above all to New Zealand, where it was welcomed. It does not seem that British New Guinea [later renamed Papua New Guinea] contributed its transmission, although the Dutch region of this large insular territory [Dutch New Guinea, later named Irian Jaya = Irian Barat or West New Guinea] did adopt the soybean, either from Mindanao (Philippines) or from Java [Indonesia].

Tables show: (1) Production and utilization of soybeans in the USA in 1934 and 1935, by states (in 100 metric tons) (p. 18-19). (2) Quantity and value of soybeans, soybean cake, and soybean oil imported into the USA from 1909 to 1928 (p. 26). (3) Importation of soybeans and soy oil into Great Britain (from 1913), Germany (from 1922), Netherlands (from 1913), Denmark (from 1913), and Sweden (from 1930) (all in Europe) in 1913, 1922, 1925, 1930, 1933, 1934, and 1935 (p. 41). (7A) Production of soybeans in China, Manchuria, Korea, and Japan (all in East Asia) in 1928 and 1935 (p. 51). (7B) Soybean trade among countries in Asia in 1909-13, 1922-23, 1924-25 incl. China and Manchuria, Japan, Korea, Dutch Indies, Java and Madura, Formosa, British and French possessions (p. 51).

Note 1. This is the earliest document seen (Aug. 2009) concerning soybeans in Dahomey (later Benin), Côte d'Ivoire (Ivory Coast), or Togo, or the cultivation of soybeans in Dahomey, Côte d'Ivoire, or Togo. This document contains the earliest date seen for soybeans in Dahomey, Côte d'Ivoire, or Togo, or the cultivation of soybeans in Dahomey, Côte d'Ivoire, or Togo (1939; one of two documents for Côte d'Ivoire). The source of these soybeans is unknown. Unfortunately, the author gives no documentation for this early cultivation of soybeans in Dahomey, Côte d'Ivoire, and Togo.

Note 2. Matagrin says (without citing any source) that soybean trials were conducted in Tunisia (a protectorate of France from May 1881 to 1956) in the 19th century. If that were true, this document would contain the earliest date seen for the cultivation of soybeans in Tunisia. In 1869, Tunisia declared itself bankrupt. An international commission, with representatives from France, the United Kingdom, and Italy took over its economy. In 1878 Friedrich Haberlandt wrote that he had obtained 20 varieties of soybeans at the Vienna World Exposition in 1873; at least one of these, he said, came from Tunis (Tunisia). How did soybeans get to Tunisia in order to be tested there? One possibility is that they were sent there from France by the Society for Acclimatization, which reported that it was conducting soybean trials in neighboring Algeria a few years before 1880. Address: France.

432. **Product Name:** Soya Choc-Malt (Later Renamed Soya-Choc).
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1940. January.
Ingredients: Incl. water, soybeans.
Wt/Vol., Packaging, Price: Tin-plated steel can.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1940. Jan. p. 46. "Fresh from the Factory Soya Choc-Malt comes to you charged with Phosphorus, Calcium, Magnesium, Potassium, Iron. No better Food Drink has yet been made. Give it to your children and use it in the sick room and on your breakfast table regularly. Made from carefully selected ingredients this new Food Drink may be used by all persons of every age and position in life. Purchase your supplies at the Roberts Health Food Shops. Branches in every state." This same ad was published during 1940 in the following issues: Feb. p. 32, May p. 40, June p. 40.

433. Amon-Wilkens, Juan. 1940. The soy bean and sound nutrition. *Nature's Path to Health (Melbourne, Australia).* March. p. 31-32. [1 ref]
• ***Summary:*** This article, reprinted from *Nature's Path* (New York City), discusses the nutritional benefits of the soy bean and the disadvantages of consuming meat. "After an animal is slaughtered, a considerable amount of uric acid is held up in its tissues. This acid plays havoc with a person's liver and

kidneys which is the reason that the doctor will advise a patient to discontinue the eating of flesh when the patient is suffering with a kidney disorder."

"The Soy-bean is a protein that cannot be duplicated by any other anabolic or cell-building food. Biochemical investigations have disclosed the fact that the Soya-bean contains the element Lecithin, which is a great nerve-builder." The Soy-Bean also "contains vitamin D, and it is economically grown." And it is practically starch-free. A cartoon shows a figure of "The Versatile Soya Bean" smiling and dancing with hands on hips. Address: Dr.

434. *Nature's Path to Health (Melbourne, Australia).* 1940. Soya beans. April. p. 40.
• ***Summary:*** "An ancient food with many modern uses–use as a substitute for meat, cheese, milk... made up in the form of crackers, butter, sausage, cereals, salad, loaf, coffee, cheese, etc. Soya bean products are a fine source of protein and also have lecithin which is a brain and nerve constituent."

435. Morrison, Samuel. 1940. The honourable soy bean. *Nature's Path to Health (Melbourne, Australia).* May. p. 29-30.
• ***Summary:*** This is a reprint of an article by the same author with the same title published in Jan. 1940 in *Nature's Path* (USA), p. 3, 27.

A cartoon shows a figure of "The Versatile Soya Bean" smiling and dancing with hands on hips.

Note: *Nature's Path* in the USA and Australia seem to have been related, but it is not known how. Did F.G. Roberts get the idea (and maybe permission to use the title) from Benedict Lust in the United States, then publish the magazine himself in Australia?–probably. Did Benedict Lust found and own both?–almost certainly not. Did F.G. Roberts independently found and own the one in Australia (probably), or did he simply edit and publish it for Lust?–probably not. Address: N.D. [Naturopathic Doctor].

436. **Product Name:** Roberts' Soy Nut Brawn, Soy Nut Cheese.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1940. May.
Wt/Vol., Packaging, Price: Tin-plated steel can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Article in *Nature's Path to Health (Melbourne, Australia).* 1940. May. Article in *Nature's Path to Health (Melbourne, Australia).* 1940. June. "Just what you have waited for! Better health foods." A large illustration (line drawing) shows the four canned products, with the Soy Nut Roast in the largest can (1 pound) and the Soy Bean & Tomato in the smallest. "Among the more recent additions to the many lines of food produced by F.G. Roberts is a line of Better Nut foods. Very shortly now this line of health foods will be available for the purchasers of Nut Foods in all the Roberts Health Food Shops, and later in other wide awake grocer shops."

Ad in *Nature's Path to Health.* 1940. July. p. 8. "Roberts' Better Nut Foods." The same line drawing described above is shown. The cheese, brawn, and roast are described briefly in non-specific terms. "Packed in three sizes: 16 oz., 8 oz., 4 oz." Ad in Aug. 1940 issue, p. 6. "Roberts' Better Nut Foods." A photo shows the cans. The same photo and a similar ad appeared in the May/June 1943 issue, p. 26, and the Oct/Nov. 1946 issue, p. 24. However in these last two issues, only Soy Nut Roast and Soy Nut Cheese are described in the ad text.

Ad in *Nature's Path to Health.* 1940. Nov/Dec. p. 30. "Roberts' Soy Nut Recipes." The same line drawing described above is shown. The following recipes are given: Quick cutlets (made with Soy Nut Roast). Tomato stew (made with Soy Nut Roast). Nutmeat mince (made with Soy Nut Roast). Roast soya nut cheese (made with Soya Nut Cheese, which is sold in ½-lb or 1-lb tins). "Supplies always available at the Roberts Health Food Shops Throughout Australia."

437. British & Australasian College of Botanic Medicine. 1940. Complete correspondence course (Ad). *Nature's Path to Health (Melbourne, Australia).* June. p. 15.
• ***Summary:*** The principal of this college is Mr. F.G. Roberts, N.D., D.O. This course is designed to "meet a growing demand for a comprehensive study of Herbs in their treatment of disease..." The course deals with botanical medicine, combination and dosage, specific uses of herbs, formulas and prescriptions. Text books have been carefully selected by F.G. Roberts, principal. Address: 284 Post Office Place, Melbourne, Victoria [Australia].

438. Morse, W.J. 1940. Soybeans around the world. *Proceedings of the American Soybean Assoc.* p. 72-74. 20th annual meeting. Held 18-20 Aug. at Dearborn, Michigan.
• ***Summary:*** The areas where soybean production has recently increased are the East Indies, Rumania, Austria, Bulgaria, Czechoslovakia, and Yugoslavia. "Soybean production in the Danube Basin in 1939 amounted to approximately 5 million bushels. The acreage in Bulgaria, Hungary, Rumania, and Yugoslavia increased more than 60% in 1940, this being attributed to the activities of two German companies which distributed selected seed and inoculation culture, and contracted in advance for taking the entire production at increased prices. The Greek government planned extensive cultivation of soybeans in 1940, providing for importation of seed, requiring

compulsory cultivation of the crop, and the purchase of the entire crop from farmers at remunerative prices."

The increase in production has been largely due to the development of adapted soybean types through introduction, selection, and hybridization. "Soybean breeding programs have been carried on extensively in Germany, Russia, Netherland Indies, Rumania, Japan, Manchuria, South Africa, Canada, and some of the Balkan countries, and to a lesser extent in Sweden, England, Holland, France, Italy, Poland, Australia, India, and the Philippines."

"The outbreak of hostilities in Europe and the resulting interference with the flow of Manchurian soybeans into European markets brought about a rather critical situation to the producers in that part of the Orient. Moreover, Manchurian authorities on November 1, 1939, set up a soybean monopoly whereby the government purchases all soybeans for sale, fixes the price, and makes all export sales... Soybean exports from Manchuria for the first 8 months of the 1939-40 marketing year amounted to approximately 24 million bushels as compared with 59 million bushels for the corresponding period last season. Exports to Europe during the 8 months of this season were estimated at about 4 million bushels as compared with actual exports of 32 million bushels for the same months in 1938-39. About one million bushels were exported this year to Germany via Trans-Siberian Railway, and over 2.5 million bushels to Europe by sea, a major portion of which went to Italy.

"With practical cessation of direct shipments to European countries, Japanese and Manchurian officials began concentrating on the development of new industrial outlets for soybeans. The process of making usable protein from soybean material as a substitute for imported milk casein has been widely studied by government and industrial agencies in Manchuria and Japan. At present the principal ways in which soybean protein is substituting for milk casein are as glue for wooden articles, furniture, veneer, plywood, etc., paper sizing, as the adhesive element in insecticides and water paints, and as material for artificial wool and plastics. In 1938 more than 22 million pounds of soybean glue were used. A few Japanese companies have industrialized the manufacture of protein on rather an extensive scale. In Japan only one firm is reported to be producing soybean plastics, and these are not entirely satisfactory. Soybean fiber, or casein fiber as it is known in Japanese trade circles, is manufactured exclusively by one concern which sells its products to a spinning firm for making into yarn and cloth. The present capacity of the factory is about 22,000 pounds per day although actual daily production is said to be only about 13,000 pounds. The fiber known as 'Silkool' has not yet been exported. The domestic prices range from 33 to 35 cents per pound.

"A sample of 'Soyalex' recently received from Japan was said to contain not less than 60% pure lecithin. This new soybean product may be used in making butter, chocolate, for dressing of leather, making of shoe polishes and toilet foods such as face creams and soaps, for cooking, making noodles and macaroni, and in the preparation of valuable chemicals." A portrait photo shows W.J. Morse.

Note 1. This is the earliest document seen (Jan. 2000) concerning the cultivation of soybeans in Sweden.

Note 2. This is the earliest English-language document seen (Dec. 2004) that uses the term "soybean fiber" to refer to spun soy protein fiber used like a textile fiber. Address: USDA Bureau of Plant Industry, Washington, DC.

439. *Nature's Path to Health (Melbourne, Australia).* 1940. Germany's secret weapon–The soy bean. Aug. p. 21, 24.
• ***Summary:*** "Following the defeat of Poland, the world discovered that one of Hitler's secret weapons was hidden in the rations of his soldiers. The use of the 'magic bean' enabled the German troops to advance very quickly because of the fact that by using soy beans in food preparations the soldier is able to carry three days supply in his haversack.

"We are informed that Germany has manufactured an excellent flour from soy beans called Edelsoja, which it is claimed can replace meat or other similar foods."

"There should be ample space in Australia for the production of this beans on a very much larger scale than has yet been attempted. Private persons have demonstrated that this bean can be grown in Australian kitchen gardens without much trouble, and with considerable profit. With surplus stocks of wheat mounting high in Australia, and with the dwindling stock of soy beans due to war conditions, the local cultivation of this 'magic bean,' which originated in the East but is now very much in the West, should be encouraged.

"The diet of the future will be less in the direction of flesh foods and more in the way of a sound health regime, judging from the general trend in the world of dietetics just now.–Contributed."

Note: A similar article titled "A vital German supply–The magic bean–Soya food for man & beast" appeared 4 months earlier in the *Times* (London; 23 April, p. 7f, 8a).

440. Schmitt, R.P. 1940. The versatile soy bean: Food of a thousand uses. *Nature's Path to Health (Melbourne, Australia).* Aug. p. 5-6.
• ***Summary:*** "Before 1935, the soy bean was an insignificant factor in the health food store. Since then, however, its increase in popularity has been phenomenal, with the result that it is now one of the major sellers in the field. One reason for this growth is the soy bean's versatility: from it are produced flour, milk and cheese, bread, crackers, cereals, meat substitutes, candies and canned soybeans to be served as a vegetable. Almost no

other item of food can claim such diversification of products. And the ways of preparing it are infinite..." It is also a good source of protein, vitamins, and minerals, and its low starch content makes it valuable in diabetic diets. It is easy to digest, "is not gas-forming, and does not encourage the growth of putrefactive bacteria in the intestinal tract, as do other high protein foods. On the contrary, it builds up acidophilus bacteria, which combat putrefaction in the digestive system.

"Then, too, it is alkaline in action: it has 20 times the alkalinity of cow's milk, and five times that of citrus fruits... Yet it one of the most economical foods." Address: Penna Soya Products [Williamsport, Pennsylvania], USA.

441. Wolman, Minka. 1941. There is no indigestion in Japan. *Argus (The) (Melbourne, Victoria, Australia).* April 5. p. 15S.
• ***Summary:*** "Polished rice is the principal food,... Shoyu (soy) sauce and the many preparations of the soya bean are used in almost every dish."

"Shoyu sauce" is used to season sukiyaki, tempura, sashimi, and kabayaki (grilled eels; "A thick tasty sauce made from shoyu is poured over them").

442. *Agricultural Gazette of New South Wales.* 1941. The soybean. 52(6):314. June.
• ***Summary:*** A half-page overview of the current status of soybeans worldwide. "First introduced to American agriculture in 1898, the soybean is now the basis of a multi-million dollar industry... According to the 1939 Census of Manufacturers, 47 manufacturing establishments in the United States were engaged primarily in the production of soybean oil, cake, and meal, the value of the products being 44,000,000 dollars."

Also discusses: Food uses of soybean oil (mainly in shortening and oleomargarine), lecithin, and soybean flour. Industrial uses of soy protein (acts like casein in plastics, paints, size for paper, textile dressing, and waterproofing). First record of cultivation in China in 2838 B.C. Manchuria is the world's leading soybean producer, with Chosen [Korea], Japan, and South China ranking high. Introduction to Europe in the 17th century. Tried in Germany, England, France, and Hungary. Germany is now the leader in making use of soybeans.

443. Ward (Eleanor). 1941. Display ad: Now! Anyone can bake Bread that is really the staff of life for 6½d. per large (2 lb) loaf. *Argus (The) (Melbourne, Victoria, Australia).* July 19. p. 6.
• ***Summary:*** "In addition to its basis of Wholemeal Flour (containing the whole of the Wheat Germ) Eleanor Ward's Bread Mix is further enriched by the addition of Soya Flour (which has twice the Protein content of Meat) and Milk."

444. Matagrin, Am. 1941. La culture du soja dans l'Empire français [The cultivation of soybeans in the French empire]. *Revue Internationale des Produits Coloniaux et du Material Colonial* 16(183):102-05. Aug. [Fre]
• ***Summary:*** Discusses the status of soybean cultivation in Guadeloupe (many trials are underway), Martinique (soybeans have not yet been introduced there), Indochina (Tonkin [15-20,000 ha], Annam [750 ha], Laos, Cambodia, Cochin China; soy is of little importance in the last 3 regions), French West Africa (Unsatisfactory trials were made in 1923 and 1926 at the experimental station at Soninkoura. In 1935 trials started again at the Banankoro station. Note: Both stations are probably in today's Mali), Algeria (soybeans are not presently cultivated there), Madagascar (soybean cultivation was introduced in 1911), Morocco (trials were started almost 15 years ago [i.e. about 1927], but cultivation is still at an experimental stage), the Island of Reunion (soybeans are cultivated only experimentally at the Agronomic Station), Tunisia (soy is of little practical importance there at present, though forage trials are being conducted), New Caledonia (soybean culture was introduced in 1928; the future does not look bright).

Note: This is the earliest document concerning soybean cultivation in the Pacific Islands (New Caledonia)–not including Hawaii, Australia, or New Zealand.

445. Koonin, Paul Maurice; Koonin, Dorothy. 1941. Soybeans the wonder food. Sydney, Australia: Harry Coy. 73 p. Health Series No. 3. 15 cm. *
Address: Australia.

446. Roberts, F.G. 1941? The natural health cook book and compilation of special diets: Containing approximately 300 meatless recipes. New rev. ed. Melbourne, Australia: F.G. Roberts' Health Academy. 84 p. Undated. Illust. Port. 22 cm. *
• ***Summary:*** This is quite a basic (no color) book. There are no advertisements in it except for health centres which are in: Adelaide, Rockhampton, Maryborough, Toowomba (2), Glenelg, and Newcastle. The only previous publication listed within it is "Long Life and How to Obtain It"–the date of whose first edition is not known; it went through at least 5 editions over the years. Address: Australia.

447. Bryant, L.H.; Morrison, F.R. 1942. Composition of soya beans grown in New South Wales. *J. of the Australian Institute of Agricultural Science* 8(3):117-18. Sept. [2 ref]
• ***Summary:*** In 1941 an experimental cultivation by Mr. C.J. Frank of Coramba, NSW, made available sufficient material to carry out systematic analyses of the soybean varieties grown.

Tests conducted by researchers at the Sydney Technological Museum on soybeans grown in northern New South Wales gave results for protein and oil content that compared very favorably with published figures for soybeans grown in Manchuria, America, and South Africa. This justifies the belief that good quality soybeans can be grown in Australia. Address: Sydney Technological Museum, NSW, Australia.

448. Paltridge, Terrence Brady. 1942. Plant introduction 2. Preliminary selection and evaluation of pasture species at Lawes (Queensland). *Council for Scientific and Industrial Research (CSIR, Australia), Division of Plant Industry. Pamphlet* No. 114. p. 15-30. *
• ***Summary:*** This is part 2 of a pamphlet titled "Plant Introduction." Part 1 (p. 1-14), titled "Review, with notes on outstanding species," is by Alexander McTaggert.

449. Swaby, R.J. 1943. Inoculation of legume seed. *Agricultural Gazette of New South Wales* 54(1):9-13. Jan.
• ***Summary:*** Contents: Introduction. Legumes and root nodule bacteria. Artificial inoculation. Groups of root nodule bacteria (seven groups, the 7th being the "Soybean group"). Cost of inoculation. The necessity of superphosphate and lime. Root nodule bacteria in the soil. Value of inoculation. Summary.

Of the seven photos: (1) Root nodules on soybean. (7) Effect of inoculation on soybeans (inoculated plant and uninoculated plant). Table 2 shows the influence of inoculation on many legumes, incl. Easy Cook [Easycook] soybeans at Glen Innes. Yield increased 13%. Address: M.Agr.Sc., B.Sc., Asst. Bacteriologist.

450. **Product Name:** Soya-Choc. Introduced in Jan. 1940 as Soya Choc-Malt.
Manufacturer's Name: Roberts (F.G.) Health Food Products.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1943. June.
Ingredients: Incl. water, soybeans.
Wt/Vol., Packaging, Price: Tin-plated steel can.
New Product–Documentation: Ad in *Nature's Path to Health (Melbourne, Australia).* 1943. May/June, p. 15. "Your best moment. When the drink is Soy-Bev or Soya-Choc. These are the nicest drinks. Freshly made from the choicest soya beans in our modern factory, St. Kilda, Melbourne. In Hygienic ½ lb. and 1 lb. Tins at all Health Centres Throughout Australia." An illustration shows a man and woman seated in chairs by their fireplace each enjoying a cup of Soy-Bev or Soya-Choc. Below this is a steaming cup of the hot beverage. This ad also appeared in the Feb/March 1946 issue (p. 25), the Aug/Sept. 1946 issue (p. 23), and the April/May 1949 issue (p. 8) of this magazine.

Note from Paul Smith of Soy Products of Australia (Pte.) Ltd. 1995. March 14. Soya-Choc = Soy Compound with added cocoa. Soya-Choc = Soya Choc-Malt of 1940. Paul thinks Soya-Choc was first introduced in about 1933 or 1934.

451. Raw, A.R. 1943. The soya bean. *Victoria J. of Agriculture* 41:477-80. *
• ***Summary:*** Soybean trials are being conducted by the Department of Agriculture in Victoria, but they think that climatic conditions will limit the successful growth of the crop in that state to a very few areas.

452. New South Wales Dept. of Agriculture. 1943. The farmers handbook. 5th ed. Sydney, New South Wales, Australia: Alfred Henry Pettifer, Acting Government Printer. viii + 1028 p. See p. 572-75. Illust. Index.
• ***Summary:*** The section titled "Soybeans" (p. 572-75) discusses: Growing soybeans in New South Wales. Climate and soil. Planting. Varieties. Soybeans for hay. Soybeans as a supplementary crop in Maize.

"Soybeans were introduced and tried out, chiefly on the coast [of New South Wales], several years ago, but were discarded as having no special merit. Further introductions (from America and elsewhere) were made more recently, however, and the crop was tested in some of the tableland districts with much more encouraging results." A few late-maturing soybean varieties that were introduced recently show excellent promise.

"The growing of soybeans in New South Wales has so far been restricted to a few experimental farms and a handful of farmers in scattered districts, but the utility of the crop is evident from these tests." In the coastal districts the varieties Otootan and Biloxi do the best, whereas Virginia and Pekin [Peking] do best on the tablelands. Address: New South Wales, Australia.

453. Year Book of the Seventh-day Adventist Denomination. 1943. Washington, DC: Review and Herald Publishing Assoc. 397 p. See p. 72, 292-93. Index. 20 cm.
• ***Summary:*** Partial contents: Institutions: Educational (p. 208-250). Publishing houses (p. 251-62). Periodicals issued (p. 263-76). Sanitariums (p. 277-88). Dispensaries and treatment rooms (p. 289-91). Food companies (p. 292-93).

The section titled "Food companies" includes: Boulder-Colorado Sanitarium Food Company (established 1895). Buenos Aires Food Company (Alimentos Granix, Sociedad Anonima, est. 1938 [Argentina]). Copenhagen Food Factory (Denmark). Food Factory "Pur Aliment" (Paris, France). German Health Food Factory (Hamburg; De-Vau-Ge Gesundkostwerk Vollmer & Lühr (formerly: Deutscher Verein für Gesundheitspflege Hamburg {e.V.})). Granose Foods, Ltd. (British Health Food Factory; Stanborough Park, Watford, Herts, England. Est. 1899). Gland Hygienic Food Factory (Fabrique de Produits Alimentaires Hygeniques "Phag," Gland, Switzerland. Est. 1896). Loma Linda Food Co. (Arlington, California. Incorporated 1935).

Sanitarium Health Food Company (Head Office, "Mizpah," Fox Valley Road, Wahroonga, NSW, Australia).

"Wholesale food branches" (of Sanitarium Health Food Company, in Australia and New Zealand; each has a manager): Adelaide, South Australia–151 Gouger St. Brisbane, Queensland–Garrick St. Melbourne, Victoria–118 Union St., Windsor. Newcastle, New South Wales–Tudor St. (Hamilton). Papanui, New Zealand–P.O. Box 11. Perth, West Australia–240 Lake St. Sydney, New South Wales–Brown St. (Lewisham).

Cafes and retail food stores (in Australia and New Zealand; the first two have a manager): Auckland, New Zealand–174 Queen St. Brisbane, Queensland–138 Adelaide St. Camberwell, Victoria–791 Burke St. Christchurch, New Zealand–698 Colombe St. Dunedin, New Zealand–8 George St. Hobart, Tasmania–43 Elizabeth St. Laucestan, Tasmania–82 Charles St. Melbourne, Victoria–293 Little Collins St. Newcastle, New South Wales, 14 and 18 The Arcade. Perth, West Australia–757 Hay St. Sydney, New South Wales–13 Hunter St. Wellington, New Zealand–83 Willis St.

On p. 72 is a directory of in "Health food factories" in the Austral-Asian Union Conference. All but one have the same name: "Sanitarium Health Food Co." They are located at: (1) Cooranbong, NSW. (2) 62 Randolph St., Auckland, New Zealand. (3) Papanui, Christchurch, New Zealand. (4) Sanitarium Buyers and Packers, Sydney, NSW. (5) Warburton, Victoria. (6) Carmel, West Australia. (7) Brisbane, Queensland. (8) Adelaide, South Australia. (9) Lewisham, Sydney, NSW. "Sanitarium Health Food Co." Address: Battle Creek, Michigan.

454. *Argus (The) (Melbourne, Victoria, Australia).* 1944. Try this recipe from China. Feb. 3. p. 6.
• ***Summary:*** "The British Ministry of Food has culled the cook-books of the world to bring tasty and economical recipes to the British housewife, and her Australian sister now coping with rationing will also find them of great value. Try this interesting recipe:

"Chop Suey (Tsap Sui, Chinese origin)." After cooking, "add the gravy mixture. A few drops of Worcester sauce would be an improvement to the gravy, and would take the place of the Soya bean sauce, so much used in China. Stir the gravy in well..."

455. Laucks, I.F. 1944. The story of soybean adhesives. *Soybean Digest.* April. p. 11.
• ***Summary:*** I.F. Laucks, a chemist operating a customs analytical laboratory, was asked by the newly established fir plywood industry of the Pacific Northwest to develop a plywood glue. Laucks worked for several years using soybean meal as the basis of his glue. For the first trial run, he persuaded one plywood factory to try one ton of the new glue. It was sufficiently good that this factory changed over their entire operation to soybean glue.

"When a number of running boards began coming apart all over the country, a committee was appointed by the plywood industry to arrange competitive tests to determine the best glue for the industry to use. The result was that soybean glue showed up considerably better than any of the rest, especially in its water resistance.

"This was the turning point in the history of soybean glue. By the latter part of 1927, about one year from the date of the competition, every plant on the Pacific coast was using soybean glue."

Photos show I.F. Laucks (the man), the I.F. Laucks Soybean Plant at Portsmouth, Virginia, and a vat where soybean glue is mixed. The company has plants in the USA, Sweden, Vancouver (BC, Canada), and Australia. Address: I.F. Laucks, Inc., Seattle, Washington.

456. *Queensland Agricultural Journal.* 1944. The soy bean in Queensland. 59(1):4. July.
• ***Summary:*** "Referring recently to the remarkable development of the soy bean industry in the United States, the Minister for Agriculture and Stock (Hon. T. L. Williams) predicted the early establishment of this crop on a substantial scale in Queensland, as a result of departmental trials with several varieties which have shown promise as a crop in general cultivation under Queensland conditions.

"The Department of Agriculture and Stock has had many varieties of soy bean under trial for several seasons past, and some promising varieties of both grain and fodder types have been selected for further field tests. Shortage of staff and the wartime necessity of concentrating on increased production of established food crops has, naturally, limited experiment work. To establish soy bean production on a sound basis, it will be obviously necessary to select a type, or types, which will prove suitable under local conditions, but also which can be harvested mechanically, so that the crop may be grown at a cost which will attract the attention of both producers and consumers.

"It should be distinctly understood, however, that *no seed stocks are at present available for distribution to farmers* by the Department of Agriculture and Stock, and that the small quantities of several varieties now held are required exclusively for trial purposes." Address: Australia.

457. McKeon, C.J. 1944. Soy bean. *Queensland Agricultural Journal* 59(5):261-63. Nov. 1.
• ***Summary:*** "Although the soy bean is not a recent introduction to Queensland, it is only within the past few years that it has shown promise of becoming a useful crop in this State." Describes the cultural requirements and the varieties under test in Queensland for forage (Otootan is the most promising and consistent) and for seeds (A.K., Tokyo, and Easycook have given good yields). Seeds are not yet

available to farmers from the Department of Agriculture and Stock.

"The chief named forage-type varieties under test in Queensland are A.K., Black Eyebrow, Ebony, Virginia, Wilson (early maturing), Laredo, Mammoth Brown, Tarheel Black (medium-late), Biloxi and Otootan (late-maturing)."

"Grain types include A.K., Dunfield, Illini, Ito San, Kingwa, Manchu, Mandell, Tokyo (early maturing), Easycook, Haberlandt, Herman, Mammoth Brown and Mammoth Yellow (medium- and late-maturing)." "Mammoth Brown, Biloxi, and Mammoth Yellow varieties have seeds three or four times as large as those of Laredo, Otootan, and Ebony."

458. Junior, Vesta. 1944. Test and tell: Festive cooking in China gives hints for Christmas cooks. *Argus (The) (Melbourne, Victoria, Australia).* Dec. 19. p. 9.
• ***Summary:*** The recipe for La Si Che (Chinese wishes) calls for "Soya bean sauce."

459. Junior, Vesta. 1945. Test and tell: This is a "request number" in which queries are answered. *Argus (The) (Melbourne, Victoria, Australia).* Oct. 9. p. 11.
• ***Summary:*** The recipe for "Dim sums" says: Mince pork thoroughly. "Season with salt, pepper, and a little soya sauce.

"Roll pastry as thin as possible and cut into rounds about 4 in. in diameter. Fill with mince and shape into pies. Steam for an hour and serve with soya sauce."

460. *Soybean Digest.* 1945. Australian studies U.S. bean crop. Oct. p. 16.
• ***Summary:*** Donald Shand, special agricultural investigation officer of the Commonwealth of Australia, recently made an inspection of the U.S. soybean industry, arriving on May 23. Mr. Shand runs a farm of 4,500 acres in the New England section of New South Wales, about 350 miles north of Sydney. Since the outbreak of World War II, Australia has made great progress in expanding production of row crops, however at present only about 200 acres of soybeans are grown in the entire Commonwealth. Yet he was recently notified by his government that 300 farmers have indicated their desire to cooperate in testing varieties which he plans to send back from the USA.

Mr. Shand said that the rapid development of the soybean industry in America is "an outstanding example of what co-operation between the agricultural scientists, manufacturers and farmers can do... Mr. Shand paid a special tribute to the kindness extended to him by Dr. W.J. Morse, whose untiring efforts in the soybean industry have meant much to its development." A photo shows Mr. Shand.

Note: This is the earliest document seen (March 2010) that gives soybean production or area statistics for Australia (200 acres), or for any country in Oceania.

461. *Agricultural Gazette of New South Wales.* 1946. Beekeeping hints: Feeding bees with natural pollen and soybean flour. 57(1):33-34. Jan. [1 ref]
• ***Summary:*** This is a summary and partial reprint of an article by C.L. Farrar of the USDA titled "Food Reserves for Bees," published in Sept. 1945 in the *American Bee Journal* (p. 313-15, 323).

462. Goodacre, W.A. 1946. Beekeeping notes: Pollen substitutes. *Agricultural Gazette of New South Wales* 57(2):99-101. Feb. [1 ref]
• ***Summary:*** A summary of research by M.H. Haydak in the USA, and Extension Folder 130, published by the University of Minnesota. Contains three formulas for using soybean flour as a pollen substitute for honey bees. Address: Senior Apiary Instructor.

463. *Queensland Agricultural Journal.* 1946. Soy bean production. 62(3):132. March.
• ***Summary:*** Mr. Williams said that the Council unanimously approved of the Commonwealth's proposal to foster the growing of soy beans on a more extensive scale. "It was accordingly decided that a number of officers from State Departments of Agriculture–including one from Queensland–should be sent to America at an early date to gain first-hand information relative to the planting and harvesting and processing of this particular crop, for which there is apparently a big future in Australia." Address: Australia.

464. *Soybean Digest.* 1946. Increase Australian soybean acreage. June. p. 6.
• ***Summary:*** According to Donald Shand, about 10,000 acres of soybeans will be planted in Australia this year as a result of the trip that he made to America in 1945. The soybeans grown in Australia will be used for oil extraction and livestock feeding. In a recent speech at a farmer's conference at Armdale, New South Wales, Mr. Shand said: "The story of the soybean is one which fascinates any visitor to the States." He especially praised the work of Dr. W.J. Morse.

465. Goodacre, W.A. 1946. Beekeeping hints: The importation of soybean flour as a pollen substitute. *Agricultural Gazette of New South Wales* 57(9):492-94. Sept. 1.
• ***Summary:*** Contains 3 formulas for using soybean flour in pollen substitutes: (1) Four parts soybean flour and 1 part dry skim milk; (2) Nine parts soybean flour and 1 part medicinal yeast; (3) Six parts soybean flour and 1 part animal yeast. The mixtures are fed dry or in paste form. To make the paste, mix 1 lb substitute with 1 quart of sugar syrup made with 2 parts of sugar to one of water by volume.

Address: Senior Apiary Instructor, Hawkesbury College, NSW, Australia.

466. Gray, S.G. 1946. The cultivation of soybeans in Australia. *Revue Internationale du Soja* 5(31-32):129-31. Sept/Oct. [8 ref. Eng]

• ***Summary:*** The soybean is not a widely know crop in Australia, but considerable interest is being taken in its potential, largely because of its remarkable rise to fame in the USA. The Queensland Acclimatisation Society has been growing soybeans in small trials near Brisbane for more than 20 years, and has found that they grow quite well there. One company in Queensland is growing soybeans commercially about 100 miles northeast of Brisbane. Since 1936 the Council for Scientific and Industrial Research (CSIR) has been testing a large number of varieties at its plant introduction stations in southern and central Queensland, with variable results.

During the last few years, a small number of farmers have been growing soybeans commercially in the tableland districts of northern New South Wales, but no accurate accounts of their results are available.

Soybean protein is important in Australia as a source of glue for the veneer and plywood industry. Large quantities of soybeans have been imported into Australia for this purpose. Address: BSc, Agriculture, Sydney, Australia.

467. Elliott, H.G. 1946. The soybean. Its possibilities in W.A. [Western Australia]. *J. of Agriculture, Western Australia* 23(4):285-93. Dec. Summarized in Soybean Digest, Nov. 1947, p. 34.

• ***Summary:*** Contents: Introduction. Economic position. Soybean oil. Uses of oil. Origin. Uses in Western Australia. Name and origin. Description. Climate. Soils. Cultivation. Fertiliser. Inoculation. Sowing. Intercultivation. Harvesting. Varieties. Summary of soybean trials in W.A. (using mostly American or Canadian varieties). Some edible varieties of soybeans (as a green vegetable, a cooking dried beans).

"In Australia, the acreage grown is as yet only small and up to the present time has been mainly experimental." In Western Australia it is doubtful if the soybean could compete as a fodder with other summer-grown fodders.

Varieties: The "Council for Scientific and Industrial Research have obtained best results with Charlee, Haberlandt, Creole and Georgian varieties in Queensland, whilst Manchu Yellow and Haberlandt have been grown with some success in Western Australia and yields as high as 35 bushels per acre have been obtained experimentally.

"Summary of soybean trials in W.A.: The Department of Agriculture of this State has for many years introduced numerous varieties of soybeans for trial at various centres over a wide range of soil and climatic conditions, from as far North as Ord River in the Kimberleys to Albany on the South coast, and the results to date have not been completely successful. The early trials did not meet with much success because of three main factors–1. Inability to obtain good inoculation on plants as a suitable strain of bacteria for inoculation of seeds was not available. 2. Suitable strains and varieties of soybeans were not available as those tried were too long in maturing. 3. Low germination of seed imported for trial. In recent years better results have been obtained" since these problems are been solved. "Of the varieties grown in the South-West, Manchu Yellow, Haberlandt, Arysoy, Easy Cook, Harrow Mammoth Brown, Kenway and Q1463 have all given reasonable results, with yields of up to 30 bushels per acre of seed.

A table (p. 292-93) shows that at present in Western Australia some 51 soybeans varieties from the USA and 18 varieties from Canada are under trial at various centers. For each variety the following information is given: name, average number of days to mature (range: 89-126), yield (6 varieties have yields from 35.0 to 37.44 bushels/acre), and whether or not the seed color is yellow.

Named American soybean varieties under trial: Ito San, Ohio 9100, Manchu, Black Eyebrow, Elton, Aksarben, White Eyebrow, Wilson 89, Ohio 9035 (Hamilton), Ohio 7490, Ohio 9016, Wilson, Ebony, Medium Green, Habaro, Haberlandt, Mikado, Royal, Peking Sel 1-21-8, Peking Sel 1-21-5, Peking Sel 1-21-7, Peking Sel 1-21-3, Sherwood, Virginia, Peking, Shingto, Chestnut, Early Yellow, American Coffee Berry, Early Black, Sable, Wisconsin Black, Medium Early Yellow, Medium Early Brown, Medium Early Black, Ohio 7046, Mongol, Taha, Jet, Haberlandt, Chernie, Nuttall, Ohio 7476, Medium Green, Amherst, Mever [Meyer], Cloud.

Named Canadian soybean varieties under trial: St. Anne's No. 92, Early Brown, Mandarin, Yellow 210, Yellow 17, Chinaton Echo, Italian, O.A.C. No. 211, O.A.C. No. 81, Summerland, Black (China), Early Korean, Green, Manchu, Black Eyebrow, Ito San, Golden, A.K.

Varieties grown experimentally in New Zealand and having an average yield of 23 bushels: Early Yellow, O.A.C., Black Ontario, Manchu (Hudson), Manchu (Ottawa), Cayuga.

Edible varieties of soybeans that are good for use as a green vegetable: Agate, Hahto, Easycook, Rokusen [Rokusun], Funk Delicious, Kura, Aoda, Bansii [Bansei], Shiro, Hokkaido, Chusei, Higan, Janro [Kanro?], Willoni [Willomi], Nanda, Jogun.

Edible varieties of soybeans that are good for use for cooking as dried beans: Easycook, Chusei, Rokusen, Jogun, Hokkaido, Janro [Kanro].

Note: This is the earliest document seen (Oct. 2004) that clearly mentions the soybean variety Chinaton Echo. Address: Agrostologist, Western Australia.

468. Johanson, R.; Lugg, J.W.H. 1946. Sulphur distributions, with special reference to the cystine plus

cysteine and methionine contents of the seeds and seed proteins of two varieties of soya beans. *Australian J. of Experimental Biology and Medical Science* 24(4):321-25. Dec. [31 ref]

• ***Summary:*** The seeds of Dunfield and Lincoln soybean varieties were examined for the sulphur distributions. The cystine and methionine contents of the "whole" proteins in both varieties were very similar. Address: Univ. of Melbourne.

469. *Soybean Digest.* 1946. Australian meeting. Dec. p. 35.

• ***Summary:*** According to Donald Shand, the National Soybean Growers and Producers Association of Australia will be holding a field day at Armdale, New South Wales, in late January, 1947. Shand, honorary organizer of the project, reports that large acreages of Lincoln, Dunfield, and Richland soybeans are being planted in the Armdale area.

470. Stahel, Gerold. 1946. Foods from fermented soybeans as prepared in the Netherlands Indies. II. Tempe, a tropical staple. *J. of the New York Botanical Garden* 47(564):285-96. Dec. [6 ref]

• ***Summary:*** Contents: Summary. Introduction. Experimenting with tempe. Native method of manufacture (used by a Javanese peasant woman named Sinem, living near Lelydorp. "Every day she makes about 80 tempes for sale"). Packaging the tempes (in large leaves). Rapid deterioration (after the tempe is 2½ days old). Quantities measured (losses during preparation and fermentation). Large tempes for festive occasions (containing 1 kg of soybeans in a layer 1 to 1½ cm thick fermented between leaves in a bamboo tray about 1 foot in diameter). Directions for making tempe.

During World War II, "soybeans were sent to New Guinea [probably Western New Guinea, called Netherlands New Guinea in 1946] by the United States Government to feed the Europeans and Indonesians living there. For two years the people had had none of this to them important food. What the shippers did not realize, however, was that plain soybeans would be unpalatable to people of Indonesian eating habits. A specific fungus was needed to ferment the soybeans into *tempe,* a food that would be relished. Since the Papuans, the aboriginals of New Guinea, do not use soybeans in any form, all cultures of the fungus were lost when connections were broken with other Indonesian islands.

"The author then was asked to send the tempe fungus from Surinam, where it was known to be in use by Javanese people living there. The pure cultures and quickly dried tempe cakes arrived in New Guinea by plane in a little more than a week. The people then were able to use the ample stores of American soybeans by making their familiar and well liked tempe cakes."

The author isolated the tempe fungus and used it to make tempe in a laboratory. He describes several local Surinam methods of making and packaging tempe. In Surinam the inoculated soybeans are wrapped in large monocotyledonous leaves, e.g., of the family Musaceae (such as the genera *Musa* and *Heliconia),* and also of the family Marantaceae, such as *Ischnosiphon.* 30 to 40 grams of inoculated beans are folded into each leaf. Then the packet is tied with rice straw or with raffia.

Photos show: (1) A young lady in the Paramaribo market, Surinam, holding a round bamboo tray loaded with leaf-wrapped packets of tempe. (2) Two close-up shots (four-fifths natural size) of cakes of tempe as sold in the Paramaribo market; on the upper cake is a luxuriant growth of *Rhizopus Oryzae,* whereas on the lower cake the growth of the fungus is more scanty due to insufficient oxygen supply. (3) Longitudinal and cross-sectional views of "tempes" from the Paramaribo market; the lower ones are still wrapped in banana leaves. (4) Ten cakes of tempe made in a laboratory. All were wrapped with an Ischnosiphon leaf before incubation. Two cakes are shown still wrapped with the leaf, tied around the middle with a string. (5) "A large tempe, one foot in diameter, cultured between Ischnosiphon leaves on a flat bamboo basket called a 'tampa.'" (6) A lady "Making a tempe package with Ischnosiphon leaves."

Note: This is the earliest article seen about tempe [tempeh] published in the United States. Address: Director, Agric. Exp. Station, Paramaribo, Surinam.

471. Bascom, William R. 1946. Economic Survey of Micronesia for the U.S. Navy. Vol. 7. Human and economic resources–Ponape, Eastern Carolines. Honolulu, Hawaii: U.S. Commercial Company. 287 p. See p. 126-27. [231* ref]

• ***Summary:*** In Chapter 2, "The people," Section B is titled "Cultural data." From the Introduction (p. 18) we can extract a brief chronology. Before 1826–Native period. 1826. O'Connell is shipwrecked. 1826-1886–Pre-Spanish period. 1899–Germany purchases Ponape, together with the rest of the Carolines and most of the Marianas, after Spain had been defeated in the Spanish-American War. 1914 Oct.– The Japanese Navy takes control of Ponape and rules it with a military government; a civilian administration is added in 1918. 1920–The Carolines become a Japanese mandate under the League of Nations. 1922–A Japanese civilian administration called the South Seas Government *(Nanyo Cho)* is added. The Japanese Period ends in Sept. 1945 near the end of World War II, with a surrender to U.S. forces; the American Period begins.

In Chapter 6, "Resources and production," Section A is titled "Agriculture." The introduction states (p. 171-72): The Japanese established the Tropical Industries Research Station at the site of the Pohnpei Agricultural Station [in 1926]. Agricultural investigations were under the direction of Mr. Moritaro Hoshino; a manuscript written by him, reporting the results of his investigations, was made available to this Survey and translated in part; it is the source of some of the following information: "The Japanese on Ponape grew a variety of foods for their own use. In 1934 small government-subsidized truck gardens were started in Palikir, and during the war this activity expanded until the island was almost entirely self-supporting. Sweet potatoes and cassava seem to have been the most important staples, but many other plants were also grown... the Japanese grew tomatoes, green peppers, okra, *mitsuba,* spinach, kohlrabi, cabbage, lettuce, a kind of parsley, water cress *(mizu napa),* turnips, radishes, carrots, peanuts, soya beans, and rice. Of those in the latter group, at least lettuce, peanuts, and rice had been planted in small quantities by the Germans."

Note 1. This study was republished in 1965 in *Anthropological Records* (University of California Press). 22:1-156. April. 15. See p. 87.

Note 2. This is the earliest document seen (March 2010) concerning soybeans in Micronesia, or the cultivation of soybeans in Micronesia. This document contains the earliest date seen for soybeans in Micronesia, or the cultivation of soybeans in Micronesia (1945 or before). The source of these soybeans was probably Japan.

Note 3. Thanks to Diane Ragone (July 2002) of the National Tropical Botanical Garden (Kauai, Hawaii) for providing the 1965 source. Address: [Univ. of California].

472. *Chemurgic Digest.*1947. Soybean production to be increased. March 31. p. 108. [1 ref]

• ***Summary:*** According to an article in *Australian Agricultural News,* the demand for soybeans in Australia now exceeds production for present cultivated areas and big developments are planned for the expansion of the industry. In Brisbane (Queensland), Melbourne (Victoria), and Sydney (New South Wales), mills have been prepared to process 1,000 tons of soybeans a week each. Australian manufacturers have already placed orders for 30,000 tons of oil a year. In New South Wales this year, 2,000 acres of soybeans have already been planted and it is hoped that there will be large increases during the coming season.

Note from Paul Smith of Soy Products of Australia Pty. Ltd. 1995. April 11. The plants in Brisbane, Melbourne and Sydney were probably owned by Meggitt Ltd., now owned and operated by Cargill. Paul thinks the figure of 2,000 acres of soybeans in much too large. He suspects the total processing capacity of 1,000 tons per week actually refers to the capacity to process a variety of oilseeds, including safflower, sunflower, canola (rape), linseed, cottonseed, soybean, etc. and that total output per annum was in the order of 30,000 tonnes.

Note: According to the 1966 *Soybean Digest Blue Book* (p. 95), Meggitt Limited has: "Plants at Parramatta (N.S.W.), Melbourne (Vic.), Brisbane (QLD), Port Adelaide (S.A.)." They have 9 expellers with a capacity of 225 tons/day. Storage capacity: 185,000 bu. They make "'Meggitt' soybean meal, pellets, mixed feeds and soy flour. Approximate soybean operations, 5,000 tons (10%)."

473. Kerle, W.D. 1947. Soybeans. *Agricultural Gazette of New South Wales* 58(5):227-31. May 1; 58(6):295-98. June 1. Summarized in Soybean Digest, Nov. 1947, p. 34.

• ***Summary:*** Contents: Introduction. World distribution. Experience in New South Wales. Soil and climatic requirements. Soil preparation. Time and methods of sowing. Fertilisers. Inoculation of seed. Varieties. After cultivation. Rotation. Harvesting. Storage. Yields. Insect pests and diseases. Uses of soybeans (soybean oil for food and industrial purposes, soybean meal for livestock feed, soybean plastics and wool, soybean flour, green vegetable soybeans, soybean milk, sprouts, mature soybeans). Economic aspect of soybean growing.

Experience with soybeans in New South Wales extends over the past 30 years [i.e., since about 1917]. Hundreds of varieties have been imported from East Asia, the USA, and other countries, and field experiments have been conducted in all districts of the State. Numerous trials have been conducted at Hawkesbury Agricultural and Experiment Farms with varieties, cultural practices, fertilisers, seed inoculation, etc. Several soybean varieties are now recommended and the Northern Tablelands have been shown to be the district best suited to seed production, yet the yields there (averaging 7 bushels/acre over a ten year period) have not been sufficient to recommend soybeans as a commercial crop. Yields of over 20 bushels/acre, however, have been obtained in variety trials. The best variety is Potchefstroom 169, originally from South Africa. Other good varieties available in NSW include Easy Cook [Easycook], Haberlandt, Otootan, Lincoln, Dunfield, and Richland.

Before World War II, soybeans were imported from China and the Netherlands East Indies for about 6 shillings per bushel. During the war the price for soybeans (whose production was very small) was as high as 42 shillings per bushel, and contracts were let at 25 shillings by the Commonwealth Government in 1942-43. Of all the states of Australia and New Zealand, Queensland now seems to show the best promise of success in growing soybeans.

In 1924 in the USA only about 6% of soybean production was crushed for oil, but in 1940 this figure rose to 83%.

Photos show: (1) Farmer standing in a field of high soybeans on the North Coast. (2) A field of soybeans in the early stages of growth. (3) Soybean roots showing well-developed nodules. (4) Mature plant of Potchefstroom 169. (5) A man examining Easy Cook [Easycook] soybeans growing in a field. (6) Soybeans "cocked" after harvesting with reaper and binder. (7) Soybeans being grown as a green manure crop between tung oil trees. Address: Special Agronomist, New South Wales.

474. Bulcock, F.W.; Mullett, H.A.; McKeon, C.J.; Grantham, H.A. 1947. The soybean industry. Report of the Commonwealth Mission of Investigation into the industry in U.S.A. and on its possible establishment in Australia. Melbourne, Australia: Dept. of Agriculture. 83 p. June. Summarized in Soybean Digest, Nov. 1947, p. 34. [43 ref]
• ***Summary:*** Contents: Introduction. Acknowledgments. Soybean industry in the U.S.A.: The plant, uses of soybeans and their derivatives, processing soybeans, production and distribution in U.S.A., climate and soils in U.S.A. and Australia compared, growing the crop in U.S.A., costs of production of soybeans in U.S.A. and probably costs in Australia. Possible uses in Australia. Agricultural research organisation in U.S.A. Summary. Recommendations. Appendix: Itinerary of the mission, industrial development, proportion of meal and oil etc. derived from processing soybeans, the use of soybean oil in paints and varnishes, organisation chart, Northern Regional Research Laboratory, Peoria, Illinois. U.S.A. production and distribution, 1924-43. Table showing relative importance of specified farm products in the U.S. corn belt states. Soybean varieties classified according to maturity. Notes on breeding technique. Values of soybean meal compared with other concentrated stock foods. Bibliography. Address: 1. Director-General of Agriculture, Dep. of Commerce and Agriculture, Australia.

475. *Soybean Digest.* 1947. Soy foods in New Guinea. Nov. p. 14-15.
• ***Summary:*** This is a summary of two articles by Gerold Stahel (of Paramaribo, Surinam) on tempe [tempeh] and taohoo [tofu] published in late 1946 in the *Journal of the New York Botanical Garden.* Three photos show tempe and two show taohoo.

Note: This is the earliest document seen (June 2002) that uses the term "Soy foods" in the title.

476. Plomley, K.F. 1947. Testing of adhesives for wood. Testing of soy bean glues. Progress Report No. 1. The gluing properties of various species with a soya bean adhesive and the investigation of optimum proportions of lime and caustic soda. South Melbourne: Australia Council for Scientific and Industrial Research. Div. of Forest Products. Project V.G. 4-4. 9 p. Dec. [3 ref]
Address: Australia.

477. Plomley, K.F. 1947. Testing of adhesives for wood. Testing of soy bean glues. Progress Report No. 2. The effect of the proportion of tetrasulphide on the strength of soya bean glue. South Melbourne: Australia Council for Scientific and Industrial Research. Div. of Forest Products. Project V.G. 4-4. 4 p. Dec.
• ***Summary:*** When tested wet after soaking in cold water for 24 hours, glues containing from 2 to 4 parts of tetrasulphide were markedly superior in strength to those with 0 or 1 part. Address: Australia.

478. Kerle, W.D. 1948. Soybeans: Greater yields obtained by harrowing growing crops. *Agricultural Gazette of New South Wales* 59(1):9. Jan. 1.
• ***Summary:*** Experiments at New England Experiment Farm, Glen Innes, last season showed clearly that soybean plants benefit from harrowing, but it must take place before inter-row cultivation, otherwise the young plants can be uprooted. Harrowing across the rows is the most effective way to check weed growth (particularly in the rows themselves) provided it is done on a warm day and the plants are from 4 to 6 inches high. The soybean plants (variety Potchefstroom 169) in a harrowed section of an experiment gave a higher yield (30.5 vs. 22.5 bu/acre), were taller and more vigorous; the weed growth was only light. By contrast, in non-harrowed areas, the soybeans were stunted and yellowish, and weeds grew profusely. Address: Special Agronomist.

479. Plomley, K.F. 1948. The effect of the proportion of tetrasulphide on the strength of soya bean glue. South Melbourne: Australia Council for Scientific and Industrial Research. Div. of Forest Products. Project V.G. 4-4. 4 p. Jan. Project V.G.4. Testing of adhesives for wood. Subproject V.G. 4-4. Testing of soya bean glues. Progress report No. 2.
• ***Summary:*** The glue shear strength of jarrah plywood bonded with soya bean glues containing 5 different amounts of tetrasulphide was determined. When tested wet after soaking in cold water for 24 hours, glues containing from 2 to 4 parts of tetrasulphide were markedly superior in strength to those with 0 or 1 part. Address: Australia.

480. *Agricultural Gazette of New South Wales.* 1948. What are soybeans worth? 59(2):76, 87. Feb. 1.
• ***Summary:*** "Some New England farmers are still holding last season's relatively small production of soybeans for an average price of 35*s.* a bushel."

"Approximately 300 bushels of soybeans are required annually for the whole of Australia to manufacture a special preparation used by diabetics." Discusses current prices of soybeans, other vegetable oils and meals worldwide, including peanut oil, linseed oil, and linseed meal. Address: Special Agronomist.

481. Roberts, F.G. 1948. The return of the edible soya bean. *Nature's Path to Health (Melbourne, Australia).* Feb/March. p. 22.

• ***Summary:*** "The Soya Bean is a complete vegetable protein containing all the Amino acids in assimilable form; one pound of Soya Beans equals the protein value of two pounds of beef, which is much more expensive." Soybeans are an alkaline food with a wonderful chemical content.

"We are doing our best to encourage the growing of Soya Beans in Australia, we have promised the farmer a fair margin and we hope to distribute many tons of Grade 1 Soya Beans through our many branches, and other grades will be used for making Soya Flour, Soya Bean oil, Soy nut roast, Soy milk compound, Soya Bean and Soya Beans in Tomatoes."

Note: This is the first article about soy to appear in this periodical (published by F.G. Roberts and wife) since Aug. 1940, a gap of more than seven years. Hence use of the word "Return" in the title. Address: Reg. Dietitian, Australia.

482. Morse, W.J. comp. 1948. Soybean varietal names used to date (Continued–Document part 2). Washington, DC: Appendix to the mimeographed report of the Fourth Work Planning Conference of the North Central States Collaborators of the U.S. Regional Soybean Laboratory, Urbana, Illinois. RSLM 148. 9 p. May 26.
• ***Summary:*** Continued from page 5: This is a 9-page two-column table. Column 1 is "Variety name." Column 2 is "Source." P.I. refers to the Plant Introduction number. Macoupin–Farmer selection (Illinois). Magnolia–P.I. 85537. Mamloxi–Delta Exp. Station selection. Mammoth–Same as Mammoth Yellow. Mammoth Black–Same as Tarheel Black. Mammoth Brown–Source unknown. Mammoth Yellow–Source unknown. Mamotan–Delta Exp. Station selection. Mamredo–Delta Exp. Station selection. Manchu–P.I. 30593. Manchu #3–Wisconsin Exp. Station selection. Manchu #606–Wisconsin Exp. Station selection. Manchukota–South Dakota Exp. Station selection. Manchuria–Same as Pinpu. Manchuria 13-177–No source given. Mandarin–P.I. 36653. Mandarin #507–Wisconsin Exp. Station selection. Mandarin (Ottawa)–Canada Station selection. Mandell–Indiana Exp. Station selection. Mandriff–Ohio Report (Mandarin?). Manhattan–P.I. 17277. Manitoba Brown–Canada Station selection. Mansfield–Ohio Report. Mansoy–Manchu selection. Marlow–Ohio Report. Matthews–Farmer selection (Georgia). McClave–Same as Midwest. Medium Black–Same as Buckshot. Medium Early Black–Same as Buckshot. Medium Early Brown–Same as Early Brown. Medium Early Green–Same as Guelph.

Medium Early Yellow–Same as Ito San. Medium Green–Same as Guelph. Medium Yellow–Same as Midwest. Mendota–Wisconsin Exp. Station selection. Meridian–Ohio Report. Merko–P.I. 20412. Meyer–P.I. 17852. Miami–Ohio Report. Michigan Green–Same as Guelph. Midland–Ohio Report. Midunk–Funk Brothers (Illinois). Midwest–P.I. 17269. Midwest Free–Same as Midwest. Mikado–Farmer selection (Indiana). Mingo–Ohio Exp. Station selection. Minnsoya–Same as Minsoy. Minong–Probably Minsoy. Minsoy–P.I. 27890. Missoy–P.I. 71664. Misstucky–Farmer selection (Kentucky). Monetta–P.I. 71608. Mongol–Same as Midwest. Monroe-115 (Ohio). Montreal Manchu–T.B. Maeauley [sic, Macaulay] (Canada). Morgan–P.I. 22633. Morse–P.I. 19186. Mount Carmel–P.I. 70218-2. Mukden–P.I. 50523Q. Mukden #4–Wisconsin Exp. Station selection. Nanda–P.I. 95727. Nanking–P.I. 71597. Nanksoy–P.I. 104881. Nansemond–Farmer selection (Virginia). Nansemond Early–Farmer selection (Virginia). Natsu–P.I. 19984. Nela–Louisiana Exp. Station selection. Nemo–P.I. 19985. New Bush Bean–Same as Midwest. New London–Same as Midwest. Nielsen–P.I. 22644B. Nigra–P.I. 22407. Norredo–Source unknown. Norsoy (Pridesoy)–North Dakota. Northern Hollybrook–Same as Midwest. Nuttall–P.I. 17253. O.A.C. 211–Canada Exp. Station. Ogden–Tennessee Exp. Station selection. Ogemaw–P.I. 17258. Ohio 9035–Same as Hamilton. Ohio Champion–Same as Midwest. Ohio Medium Green–Same as Guelph. Okute–P.I. 19986. Old Dominion–P.I. 44512.

Oloxi–Coker's Black Beauty. Ontario–P.I. 65344. Osaya–P.I. 80465. Otootan–Formosa [later Taiwan]. Otoxi–South Africa. Ottawa Mandarin–See Mandarin (Ottawa). Ozark–P.I. 37272. Pagoda–Canada Exp. Station. Palmetto–P.I. 71587. Patoka–P.I. 70218-2-19-3. Pee Dee–Coker's 31-15. Peking–P.I. 17852B. Pekwa–Combined with Kingwa. Pelican–Louisiana Exp. Station selection. Pennsoy–Pennsylvania Exp. Station selection. Perley's Mongol–Same as Midwest. Pine Dell Perfection–Farmer selection (Virginia). Pingsu–P.I. 18259. Pinpu–P.I. 28050. Pluto–P.I. 72219. Pocahontas–Farmer selection (Virginia). Premier–Same as Midwest. Preston–Virginia Exp. Station selection. Pridesoy–Twin City Seed Co. selection. Prolific–Same as Midwest. Purredo–Same as Norredo. Quillian–Farmer selection (Oklahoma). Ralsoy–Ralston-Purina selection. Rattlesnake–Kentucky Exp. Station selection. Red Otootan–Same as Tanner. Red Sable–Same as Peking. Red Tanner–Same as Tanner. Reiching–Ohio Report. Riceland–P.I. 20797. Richfield–Ohio Report (Richland?). Richland–P.I. 70502-2. Rila–Marsh Foundation, Ohio. Roanoke–North Carolina Exp. selection. Rokusun–P.I. 80481. Roosevelt–Same as Midwest. Rose Non Pop–Farmer selection (North Carolina). Round Black–Same as Buckshot. Royal–Same as Wilson-Five. S100–Missouri Exp. Station selection. Sable–Same as Peking. Sac–P.I. 80462. Sainte Anne–Canada Station selection. Samarow–P.I. 17260. Sangra [Sanga]–P.I. 70210-1. Saskatoon–Farmer selection (Canada). Sato–P.I. 81041. Scioto–Ohio Exp. Station selection.

Sedo–P.I. 23229. Seminole–P.I. 93058. Seneca–F.C. 03654A. Shanghai–Same as Tarheel Black. Sherwood–P.I. 17862. Shingto–P.I. 21079. Shiro–P.I. 81036. Siegenthaler–Same as Morse. Sioux–P.I. 81021. Sooty–P.I. 16790B. Sousei–P.I. 80476. Southern–Same as Mammoth Yellow.

Southern Green–P.I. 62839. Southern Medium Green–Same as Tokyo. Southern Prolific–P.I. 37250. Soy Good–Same as Etum. Soysota–P.I. 28019. Stuart–P.I. 22644. Summerland–Canada Station selection [from British Columbia]. Super Quick–Same as Sousei. Suru–P.I. 89128. Swan–P.I. 22379. Taha–P.I. 21999. Tanloxi–Delta Station selection 483. Tanner–Farmer selection (Alabama). Tarheel–Same as Tarheel Black. Tarheel Black–P.I. 14952. Tarheel Brown–Same as Mammoth Brown. Tashing–P.I. 20854. Tastee–P.I. 86019. Tennessee Non Pop–Tennessee Exp. Station selection. Tensas–P.I. 104881. Texoil–Farmer selection (Texas). Tinzan–Australia selection. Toku–P.I. 86129. Tokyo–P.I. 17264. Trenton–P.I. 24610. Trinitaria–Salvador selection. U.S.-2–P.I. 70218-2. U.S.-5–P.I. 54563-5. Viking–Illinois Exp. Station selection. Vilnensis–Poland variety. Vireo–P.I. 22874. Virginia–P.I. 19186D. Virginia Brown–Same as Virginia. Volstate–Tennessee Exp. Station selection. Wabash–C463. Waseda–P.I. 80461-1. Wea–P.I. 30600. White–Same as Haberlandt. White Biloxi–Delta Exp. Station selection. White Eyebrow–P.I. 30745. Willomi–P.I. 81044-1.

Wilson–P.I. 19183. Wilson Black–Same as Wilson. Wilson Early Black–Same as Wilson. Wilson-Five–P.I. 19183-5. Wing's Royal–Same as Peking. Wisconsin–Ohio Report. Wisconsin Black–P.I. 25468. Wisconsin Early Black–Same as Wisconsin Black. Wisconsin Early Green–Same as Guelph. Wisconsin Manchu #3–Wisconsin Exp. Station selection. Wisconsin Manchu #606–Wisconsin Exp. Station selection. Wisconsin Mandarin #507–Wisconsin Exp. Station selection. Wolverine–P.I. 80490-1. Wonder–Same as Midwest. Woods Yellow–T.W. Woods Co. selection. Wyokatenn–Same as Yokotenn. Yellow–Same as Mammoth Yellow. Yellow Biloxi–North Carolina Exp. Station selection. Yellow Marvel–Farmer selection (Wisconsin). Yelnando–Coker's 433. Yelredo–Coker's 319. Yokotenn–P.I. 19981. Yoshioko–Same as Yosho. Yosho–P.I. 17262.

Note 1. This is the earliest document seen (June 2009) that mentions the soybean varieties Round Black or Yelnando. Both Yelnando (1948) and Yelnanda (1961) appear to have been developed by the Coker Seed Co. of Hartsville, South Carolina.

Note 2. This is the earliest document seen (Oct. 2004) which states that Round Black is the same as Buckshot, or that Wilson Black is the same as Wilson. Address: USDA, Bureau of Plant Industry, Soils & Agricultural Engineering, Div. of Forage Crops & Diseases [Beltsville, Maryland].

483. *Agricultural Gazette of New South Wales.* 1948. New plant diseases. 59(10):530, 536. Oct. 1.
• ***Summary:*** "During the six months ended 30th June, 1948, the following diseases were recorded for the first time in New South Wales." The diseases are arranged alphabetically under the scientific name of the 27 host plants. "Soja max (Soybean)–Soja virus 1 Gard. & Kend. (Mosaic); *Cercospora diazu* Miura (Leaf Spot or Frog Eye Spot); Grafton."

484. Beadle, N.C.W. 1948. The vegetation and pastures of western New South Wales, with special reference to soil erosion. Sydney, Australia: T.H. Tennant, Government Printer. 280 p. Illust. 25 cm. *
Address: New South Wales, Soil Conservation Service.

485. Geechoun, Roy. 1948. Cooking the Chinese way. Melbourne, Australia: W.D. Joynt. 59 p. 19 x 12 cm. Illust. by Ruth Shackel. *
• ***Summary:*** Book has 34 recipes written with ingredients listed. Contains short essays on bean curd and soy bean sauce.

486. Clinkard, Charles Ernest. 1948? Soya: The wonder food. Auckland, New Zealand: C.E. Clinkard & Co. 36 p. Illust. Undated. 22 cm. New edition or printing, 1973. Publ. by Whitcombe and Tombs. 31 p. *
• ***Summary:*** The author was born in 1883. Address: New Zealand.

487. Parham, B.E.V. 1949. List of introduced leguminous plants recorded in Fiji. *Agricultural Journal (Fiji Dep. of Agriculture)* 20(1):21-25. March.
• ***Summary:*** Under "Leguminosae," the introduced legumes are listed alphabetically by genus, and within each genus by species. The entry for soy bean reads: "*Glycine max* (Linn.) Merr. N.E. India [area of origin]. Soy bean. Cultivated, not common. Many varieties under trial 1926-1947."

Note: This document contains the earliest date seen (March 2010) for soybeans in Fiji, or the cultivation of soybeans in Fiji (1926). The source of these soybeans is unknown.

Other legumes of interest: "*Arachis hypogaea* L. Brazil. Peanut or Groundnut. Common, cultivated." "*Cajanus cajan* (Linn.) Millsp. Tropical Africa. 'Dhal (H). Pigeon Pea." "*Canavalia ensiformis* DC. Sword or Jack Bean..." "*Ceretonia siliqua* L. S. Europe. Algaroba–Carob Bean." "*Cicer arietinum* L. S. Europe and Asia. Chick Pea." "*Lens esculenta* Moench. Orient. Lentil." "*Medicago sativa* L. Europe, W. Asia. Lucerne or Alfalfa..." "*Phaseolus lunatus* Linn. Tropical America. Madagascar or lima bean." "*Phaseolus mungo* Linn. Tropics of Asia. Black gram or woolly pyrol." "*Psophocarpus tetragonolobus* DC. Tropics. Goa bean, early introduction, cultivated widely." "*Pueraria hirsuta* Scheid. (*P. thunbergiana* Benth.) China and Japan. Kudzu vine or 'Wa yaka' (F.) Widespread throughout the Colony, probably an aboriginal introduction... Roots eaten by Fijians as a vegetable." "*Vicia Faba* Linn. N. Africa. S.W. Asia. Broad or Windsor bean." "*Vigna unguiculata* (Linn.) Walp. Tropical Africa. Cowpea." "*Vigna* *sesquipedalis* (Linn.) Fruw. Yard long bean." "*Voandzeia subterranea* Thou. Tropical Africa. Bambara groundnut."

488. Tilt, J. 1949. Soybean trials in Tasmania. *Tasmanian J. of Agriculture* 19(3):163-66. Aug. 1. [2 ref]
• ***Summary:*** Tasmania is an island state of Australia, located about 150 miles south of the state of Victoria. Contents: Introduction. Description of plant. Climate. Tasmanian trials. "Various small scale trials were carried out by the Van Diemen's Land Company and the Department of Agriculture prior to the war and the results were published in the Tasmanian Journal of Agriculture for November 1939. The trials were continued at the Cressy Research Farm during 1939. The beans were sown on September 21st; yields were 2-7 bushels/acre. "The following year the beans were sown on September 24th and completely killed by a frost on October 30th." In 1941 the beans were sown a month later. The trials were discontinued during World War II, then "recommenced in 1946 with some new varieties received from the Vegetable Seeds Committee. As earlier experiences had shown the difficulties of growing the crop in an inland district such as Cressy, it was decided to locate the trials in milder districts where prospects of success would be better. The first trial to be sown comprised fifteen varieties at Messrs. J. & O. Wardlaw's property, 'Glencoe', Falmouth." Lincoln gave the highest yield, 41 bushels/acre and Boone the lowest, 4.3 bushels/acre. The average yield for all varieties was 20.3 bushels. Subsequent trials through 1949 are discussed.

In summary: The crop has proved to be uncertain, at least for the varieties tested. Trials conducted in Tasmania have shown that while soybeans can be grown in the more favored districts, the yields are not likely to be high. As long as the present high prices continue for blue and grey peas, there seems to be little justification for including so uncertain a crop in Tasmanian agriculture. Yet is it recommended that research on new varieties, more suited to Tasmania's cooler and dryer summer, be continued.

A photo shows a trial plot of soybeans in 1949 on Mr. D. Cameron's property at Leith on the North-West Coast. Table 3 summarizes yields of 16 soybean varieties in Falmouth, Bridport, and Leith. Address: Agronomist.

489. *Agricultural Gazette of New South Wales.* 1949. New plant diseases. 60(11):599-600. Nov. 1.
• ***Summary:*** "During the six months ended 30th June, 1949, the following diseases were recorded for the first time in New South Wales." The diseases are arranged alphabetically under the scientific name of the 37 host plants. "Soja max (Soybean).–(?) Big Bud virus (Witches Broom); Glenn Innes."

490. Johnson, W.; Forge, Regina. 1949. Soybeans as a green fodder for poultry: Poultry notes. *Agricultural Gazette of New South Wales* 60(12):663-64. Dec. 1.
• ***Summary:*** Describes details of a trial at Seven Hills where soybeans were first grown (planted on 5 Nov. 1947), then cut, chaffed, and fed to chickens just before flowering to the stage at which the pods were three inches long; "throughout the trial it was readily eaten by the birds." Results: The "soybean plant is a very useful summer green feed crop. It is, however, somewhat slow maturing and does not make second growth after cutting." Address: 1. Foreman; 2. Field Asst. Both: Experiment Farm, Seven Hills.

491. Gray, S.G.; Miles, J.T.; Neal-Smith, C.A. 1949. Soybean investigations in eastern and northern Australia. *Commonwealth Scientific and Industrial Research Organization (CSIRO), Division of Plant Industry. Div. Report (Australia)* No. 5. 45 p. Mimeographed. "Plant Introduction Notes No. 1." *

492. Miles, J.F. 1949. Plant introduction trials in coastal Queensland 1936-1946. *Commonwealth Scientific and Industrial Research Organization (CSIRO), Division of Plant Industry. Div. Report (Australia)* No. 6. 134 p. *
• ***Summary:*** The early experimental attempts to grow soybean in Australia, using varieties and production practices that had proved successful in the USA, had been characterized by variable vegetative vigour and biomass productivity, generally low seed yields, poor seed quality and large variety X environment interactions.

493. *New South Wales Department of Agriculture, Scientific Bulletin.* 1950. Crop, pasture and fruit breeding in New South Wales, 1930-1950. No. 72. 164 p. *

494. *Queensland Department of Agriculture and Stock, Annual Report (Brisbane).* 1950. Variety trials. 99 p. For the year 1949-50. See p. 13-22. *
• ***Summary:*** Discusses variety trials with soybeans, wheat, oats, sunflower, linseed, sorghum, and cotton.

495. Audas, James Wales. 1950. The Australian bushland. Melbourne, Australia: W.A. Hamer, Pty.; Robertson & Mullens, Ltd. 711 p. Illust. (part color). 23 cm. *
• ***Summary:*** Audas was born in 1872.

496. Morse, W.J. 1950. History of soybean production. In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 3-59. [59 ref]
• ***Summary:*** Contents: 1. Origin. 2. Ancient history. 3. Modern history. 4. Description of soybean plant. 5. World distribution. 6. Climatic adaptations. 7. Soil preferences. 8. Soil erosion and practices. 9. Varieties and variety improvement. 10. Fertilizer and lime requirements. 11. Inoculation. 12. Cultural methods: Preparation of seedbed,

methods of seeding, time of seeding, rate of seeding, depth of seeding, cultivation. 13. Rotations. 14. Mixture with other crops. 15. Hay production. 16. Seed production. 17. Soil improvement. 18. Diseases. 19. Insect enemies. 20. Other enemies (rabbits, pigeons, pheasants).

This chapter contains many original, interesting photos and a map. Figures (photos unless otherwise indicated) show: (1) Wild soybeans, cultivated soybeans, and *Glycine gracilis.* (2) Unloading soybeans from farm carts and storing the seed in osier bins in a Chinese merchant's storage yard–Manchuria. (3) Map of the principal soybean seed producing areas and countries of the world. (4) A soybean grain market in Korea. (5) "Fertilizer used for soybeans by Manchurian farmers is compost placed in piles in the field and scattered between rows of previous year's crop just before planting soybeans." (6) Roots of soybean plant (2 photos) showing abundant development of nodules. (7) Ordinary grain drill (pulled by a tractor) may be used in sowing soybeans in rows or close drills. (8) Soybeans sown by hand on ridges in rows about 21 inches apart in Manchuria. Two horses pull a wooden plow. (9) Korean woman planting soybeans along ridged rows. (10) Soybeans planted along edges of rice paddies in Japan, China, and Korea are used for home consumption. (11) Cultivating soybeans in rows, using a tractor-pulled rotary hoe, weeder, or harrow, in the Corn Belt. (12) Hand-cultivation of soybeans in Manchuria. (13) A field of plants: "The Korean farmer grows many other crops with soybeans: millet, mung beans, buckwheat, sesame, susu, or castor beans." (14) A field of soybeans and Kaoliang in China planted in alternate hills. (15) The combine has been one of the most important factors in the economic production of soybeans in the United States. (16) Harvesting soybeans by hand methods in Manchuria. (17) Threshing soybeans in Manchuria using a stone roller pulled over the plants by horse or donkey. (18) Primitive wind method of separating soybean seed from threshed plant material in Manchuria. (19) Korean farmers threshing soybeans with bamboo flails on the home threshing ground. (20) Japanese farmers turning under soybeans in a rice paddy for soil improvement. Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

497. Morse, W.J. 1950. History of soybean production: 5. World distribution (Document part). In: K.S. Markley, ed. 1950. Soybeans and Soybean Products. Vol. I. New York: Interscience Publishers or John Wiley & Sons. xvi + 1145 p. See p. 10-14.

• ***Summary:*** "The production of soybeans, which for many centuries was confined to the countries of Asia, spread rapidly after World War I to the western world, and since World War II practically all leading nations have become more and more interested in the culture and production of the crop. Agricultural experiment stations throughout the world have become engaged in the development of varieties suited to their soil and climatic conditions through introduction, selection, and hybridization. Successful results have been obtained in many countries and, in a few, acreage and production have increased to the extent that the crop has become an important factor in that nation's agriculture. This is especially true of the United States, Netherland Indies, Rumania, U.S.S.R., Austria, Bulgaria, and Poland.

"The principal zones of soybean production in the Orient are China, Manchuria, Korea, and Japan. In Manchuria, the soybean occupies about 25% of the total cultivated area and is a dominating factor in the economic life of the country. As a cash crop it provides fully half the farm income in the north and more than half the total volume of freight handled by the railroads. It is estimated that from one- to two-thirds of the production of soy beans is exported; 15 to 20% is utilized for food, feed, and planting, and the remainder is used for oil extraction.

"In China, the soybean is one of the principal and most ancient of crops, ranking fifth in extent of culture and occupying about 9% of the total cultivated area. Although grown everywhere in China, about 60% of the soybean acreage is confined to three northern provinces, Shantung, Kiangsu, and Honan. China consumes practically all of her production, estimates indicating more than 50% for food, 27% for oil extraction and other purposes, 10% for stock feed, and 8% for planting.

"Korea occupies third place among the soybean-producing countries of Asia. Acreage and production are confined largely to central and northern Korea, as southern Korea, which grows principally cotton and rice, seems to be less suited to the successful production of soybeans. The entire Korean production is used for food, stock feed, planting and export, and none is used for oil extraction.

"Japan, although a large producer of soybeans, has consumed all her production and has imported large quantities from Manchuria and Korea. Acreage and production of soybeans in Japan have decreased since World War I and greater emphasis has been placed on increased production of rice. The proportions of soybeans used by Japan for various purposes are: 'miso' (soybean-rice fermented paste), 22%; soy sauce, 22%; oil and oil cake, 21.5%; soybean curd [tofu], 15.5%; confections, 7.2%; forage, 6.2%; green manure, 2.5%; seed, 1.8%; green vegetable beans, 0.8%; and miscellaneous, 0.5%.

"In the Soviet Far East, the soybean is said to be one of the chief industrial crops and in some districts constitutes 20% of the cultivated area. Acreage and production have increased markedly since 1926, especially in Khabarovsk territory, the largest seed-producing area.

"South of China, the soybean is cultivated to some extent in the Netherland Indies, India, Siam, Cochin China, Philippines, and Australia. Until 1932, the production of soybeans in the Netherland Indies was not sufficient to meet the domestic demand. Since then, acreage and production have gradually increased until soybeans began to be exported to Holland about 1936. The soybean has been widely cultivated for a long time by the natives of the hilly regions from the borders of Afghanistan eastward to Burma, to northern Siam, and French Indo-China. The crop in India has been grown for its forage and food value rather than for commerce. Although successful results have been obtained in some of the provinces with varieties of good oil content, the growing of the crop as an oil seed does not appear to have been popular with the native farmers. In Australia successful results with American varieties have greatly increased acreage and production, especially in the states of Queensland, New South Wales, and Victoria.

"Although attempts to grow soybeans in European countries have extended over many years, it is only within the past few years that there has been any appreciable production. At present, production is confined largely to European U.S.S.R., Bulgaria, Yugoslavia, Austria, Rumania, and Czechoslovakia, production being largest in Rumania, Bulgaria, and Yugoslavia. In the development of adapted varieties, some progress has been made in Sweden, Poland, Netherlands, and Hungary. Because of the economic importance of the soybean, scientists of the U.S.S.R. have carried on extensive experiments with it, especially in the development of adapted varieties and utilization. At present, the principal areas of production are Ukraine, Moldavia, and certain regions in the North Caucasus.

"Experiments have been conducted with the soybean in nearly all regions of Africa but as yet it is an unfamiliar crop to the majority of African farmer. It has been grown successfully in the upland, midlands, and coastal districts of Natal [South Africa] and throughout Gambia, Nigeria, Egypt, the Gold Coast Colony, and also in the corn- and cotton-growing districts of the Belgian Congo.

"Although the soybean has been the subject of considerable experimental work in practically all countries of the Americas, little progress has been made in commercial culture except in the United States and Canada."

Note: This is the earliest document seen (Dec. 2007) that clearly refers to soybeans in Afghanistan, or the cultivation of soybeans in Afghanistan. This document contains the earliest clear date seen for soybeans in Afghanistan, or the cultivation of soybeans in Afghanistan (long before 1950). The source of these soybeans is unknown. Address: 6809 Fifth St. N.W., Washington, DC; formerly Principal Agronomist, Div. of Forage Crops and Diseases, Bureau of Plant Industry, Soils, and Agricultural Engineering, USDA, Beltsville, Maryland.

498. Portrait of F.G. Roberts, soyfoods pioneer in Australia (Photograph). 1950? Undated.

• ***Summary:*** This 4-by-6 inch black-and-white portrait photo, taken in about 1950, shows F.G. Roberts (1892-1977) wearing a black bowler hat, a graying mustache, a dark pinstriped suit, and a dark patterned necktie. This photo was sent to Soyfoods Center by Paul Smith, President of Soy Products of Australia Pty. Ltd. (Bayswater, Victoria, Australia). Formerly F.G. Roberts Health Food Products (Melbourne).

499. *Field Crop Abstracts.* 1951. Overseas food corporation: Australia. 4(1):48. Jan.

• ***Summary:*** Experiments are being conducted on cultivation of soyabeans, sunflowers, and cowpeas. Source: *New Commonwealth,* Nov. 1950.

500. **Product Name:** Soyvita (Roasted Full-Fat Soya Flour).
Manufacturer's Name: F.G. Roberts' Health Foods.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1951.

Ingredients: Soybeans.
New Product–Documentation: *Soya Bluebook.* 1981. p. 62; 1987. p. 75. Enzyme active full fat flour for bakery industry; heat treated soy flour for use in cakes, biscuits, doughnuts, confectionery, pies, sausages, and hamburgers.

Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. "Vincent R. Smith was a soyfoods pioneer in Australia. In 1951-52 he began to manufacture Australia's first whole (full-fat) heat-treated (debittered) soy flour." In 1956 he founded Soy Products of Australia Pty. Ltd.

Letter from Paul Smith. 1995. March 14. "Soyvita has only ever been used as a tradename for debittered full fat soy flour since 1951. Initially it was made using imported soybeans, but from 1954 it was made from Australian-grown soybeans. The tradename 'Soybake' was used for the same product packaged under the H.J. Langdon's name and address from 1955 to mid-1991, when it was abandoned due to a rationalisation of packaging and product lines. H.J. Langdon now buys the product in the 'Soyvita' packaging."

Letter from Paul Smith. 1995. April 11. Soyvita has never been used as a brand name for the retail health food products. It has only ever been used for the commodity type product which has been sold under the name and address of Soy Products of Australia Pty. Ltd. since September 1957. Prior to that the "Soyvita" name was used with/under the F.G. Roberts company name and address. "Soyvita" was only available to commercial users, therefore there was no point or interest in advertising it in *Nature's Path to Health.*

501. Roberts, J.A. 1951. Soybeans–Victorian experiments. *J. of the Department of Agriculture of Victoria (Australia)* 49:13-17. *
• ***Summary:*** The characteristics of the following mid-season soybean varieties are described: Scioto, Potch, Illini, Gibson, Chief, Patoku, Irvine's Selection, Lincoln, and Dunfield.

502. Nicolici, Dumitru. 1951. The original diet. New ed. 4th impression [printing]. Summer Hill, NSW, Australia: Printed by Religious Liberty Publishing Assoc. 151 p. Illust. 21 cm. [81* footnotes]
• ***Summary:*** Quoting extensively from Biblical scriptures and the writings of Ellen G. White, this Seventh-day Adventist book presents the principles of vegetarian nutrition, and gives details of the adverse effects on health and character from consumption of meat, dairy products, eggs, alcohol, spicy condiments, and stimulants of all kinds. Contains recipes for fruit, nut, grain, and vegetable dishes. The author was born in 1896.

Chapter 9, titled "Milk, Butter, Eggs & Cheese" is very critical of these products as foods, and suggests that they be dispensed with as soon as possible. "Thousands of infants die annually because of indigestion set up by the use of cow's milk." Cow's milk contains large numbers of germs, some of which produce diseases such as typhoid fever and tuberculosis. "Cheese must certainly be ruled off our tables as unfit for human food" since it contains large numbers of germs and microbes–"in every pound nearly twice as many as there are people upon the face of the earth."

Chapter 10, titled "The Soya Bean," provides an alternative to dairy products and meat. It begins: "The soybean has been referred to as the Wonder Food of the world... It is called the 'meat without bones.'" It is an "ideal source of protein." From soybeans can be made soya milk which is "entirely free from the disease germs that make milk a potential disease carrier." Soy-related recipes include: Mayonnaise without egg (p. 138). Soy-bean mayonnaise (with soy-bean milk, p. 138). Cooked dressing (with soy bean flour, p. 138). Soy-bean milk (p. 139). Baked soy-bean croquettes (with cooked, ground soybeans, p. 139).

503. Graszmann, H.M. 1952. Vegetable production: Pulse crops (beans and peas). *Queensland Agricultural Journal* 74(5):249-63. May.
• ***Summary:*** The first half of this long article is about the French bean *(Phaseolus vulgaris),* the most important fresh bean grown in Australia. Commercial production "has developed mainly as a winter industry in frost-free areas along the south eastern coast from Gympie" to the border between Queensland and New South Wales. The chief production centers are in the Mary Valley, the Maroochy Shire and the Redlands area. Total annual production in Queensland is over 500,000 bushels. Most of the crop is sold in Sydney and Melbourne.

The section titled "Other edible beans" (p. 260-62) discusses: Lima bean *(Phaseolus lunatus).* Scarlet runner bean *(P. multiflorus).* Broad bean *(Vicia faba).* Snake bean *(Vigna sinensis* subsp. *sesquipedalis).* Sword bean *(Canavalia gladiata).* Jack bean *(Canavalia ensiformis).* Tonga bean *(Dolichos lablab).*

The section titled "Other beans and other uses" notes that in other parts of the world, beans are more frequently used in their mature dried state. These include the pigeon pea *(Cajanus cajan)* and Garbanzo bean *(Cicer arietinum).* "Soybean *(Glycine max),* though not an important commercial crop here, is an old staple food in the Orient that has now become important in the United States." The soybean is also mentioned very briefly on p. 249.

The final section is about peas.

Note: This article shows clearly that, as recently as 1952, the soybean was an unimportant legume in Australia. Address: Horticulturist, Australia.

504. *Agricultural Gazette of New South Wales.* 1952. Legume inoculation–What it is and how it works. 63(10):663-64. Dec. 1.

• ***Summary:*** Contents: Inoculation (Unless the appropriate bacteria are in the soil, no nitrogen fixation can take place). Right kind of bacteria. When to inoculate. Easy to use; small cost. Where to obtain (From the Chief Biologist, Department of Agriculture, Box 36, G.P.O., Sydney. Indicate legume to me sown and include payment with order). Varieties of legume bacteria (seven groups; soybean is alone in its group). For legume plants only. Necessity for superphosphate and lime. Sow superphosphate and inoculated seed separately. Use carefully with seed dusts. Cultures are alive. What to expect from inoculation.

The roots of leguminous plants contain many small nodules. "Each nodule contains millions of microscopic bacteria which are of special value to the farmer" since they "can obtain nitrogen directly from the air for the benefit of the leguminous plants... This process is known as nitrogen fixation and plays an important part in maintaining soil fertility."

505. Roberts Health Academy. 1952? "Health is wealth": Natural Herbs for natural cures. Brisbane, Queensland, Australia: Roberts Health Academy. 47 p. Undated. 22 cm. *
Address: Australia.

506. *Soybean Digest.* 1953. 23 million meals of Multi-purpose food. March. p. 19.
• ***Summary:*** "Nearly 23 million 3-cent meals of the 'Multi-Purpose' food have been distributed on the hunger fronts of the world, according to a report issued by the non-profit Meals for Millions Foundation, Los Angeles...

"More than 1¼ million meals, the report states, have gone to feed Korean refugees (813,000 meals since last June). Shipments to India total 3,880,000 meals of which nearly a million have been shipped since June. Popularity of the food has been enhanced by development of special native recipes printed in the Korean and Tamil languages.

"Significant shipments have gone to the Middle East, Hong Kong, Formosa, Burma, Africa, Arabia, Japan, Philippines, Latin America, Europe, and Caribbean and South Pacific Islands.

"World-wide distribution has been through 133 American relief and religious agencies and health departments of foreign governments...

"For further information or to make contributions contact Meals for Millions Foundation, 648 South Broadway, Los Angeles 14, California."

Note: This is the earliest document seen (Dec. 2007) concerning soybean products (soy flour) in Arabia [this term usually refers to the Arabian Peninsula, but in this case it may well refer to Saudi Arabia]; soybeans as such have not yet been reported. This document contains the earliest date seen for soybean products in Arabia (March 1953); soybeans as such had not yet been reported by that date.

507. Whyte, R.O.; Nilsson-Leissner, G.; Trumble, H.C. 1953. Legumes in agriculture. *FAO Agricultural Studies* No. 21. 367 p. April. [97 ref]
• ***Summary:*** Contents: Part I. 1. Economic botany of legumes. 2. Ecological and biotic relationships. 3. Relation to soil fertility. 4. Alternate Husbandry. 5. Association with grasses. 6. Use as animal feed. 7. Tropics and sub-tropics. 8. Poisonous plants and weeds. 9. The significance of symbiotic nitrogen fixation. 10. Plant introduction and exploration. 11. Adaptation, strain variation and breeding. 12. Investigation and testing of improved strains. 13. Production of seed.

Soyabeans and the genus *Glycine* are discussed in detail on pages 275-78; they are grown in the Philippines, Siam, India, the East Indies, Natal, Transvaal, Argentina (incl. the northeastern province of Corrientes), Uruguay. "The most widespread species is *Glycine javanica* (East Indies, Manchuria, tropical Asia, Abyssinia [Ethiopia], tropical East Africa, and parts of South Africa). In Queensland, this perennial slender species is an outstanding slender legume among more recent introductions, possessing all the characteristics of a good pasture species, since it makes good growth, is palatable, and seeds prolifically. It has also shown great promise in Paraguay. In Africa, it is an excellent substitute for kudzu with similar climatic requirements. It does not yield so much, but sets seeds readily and is therefore easier to propagate... *Glycine falcata* is a herb occurring in the semi-arid grasslands of Queensland and is considered a promising pasture plant. It produces underground pods."

Soyabeans are discussed briefly at a number of countries where they are grown, including in the tropics and sub-tropics. In Jamaica (p. 105), soyabeans are recommended in a 1-year rotation with maize in higher lands with terra rossa. In Nicaragua (p. 108) soyabeans appear to be well adapted. In El Salvador (p. 108-09) the National Centre of Agronomy recommends soyabeans as a source of fodder. In Northern Nigeria (p. 119) the soyabean is used as young green fodder; its composition is given. In South Africa (p. 138-39) soyabeans have been well-established since 1926, when A.R. Saunders at Potchefstroom began a breeding program. "Hitherto, soyabean production has been approximately 700 short tons per annum. Imported and locally produced seed are used in the diet of native mine labourers and more particularly by convalescents. The oil content is too low for profitable extraction by ordinary crushing methods which leave about 6 per cent of oil in the cake. Facilities for the solvent extraction and fractionation of vegetable oils have led to a greater demand for soyabeans.

"Soyabeans are frequently grazed or used as hay... It is an important hay crop, but difficult to cure." Apart from lupins *(Lupinus albus, L. luteus,* and *L. angustifolius)* planted in late summer, soyabeans are the best annual legume used at the Dohne Research Station.

In Madagascar (p. 142-43) soyabeans have given good results at the Station agronomique du Lac Alaotra. In Pakistan, in East Bengal (p. 145) soyabeans are being grown on an experimental basis. A number of improved varieties have been developed and are being distributed to growers. In Burma (p. 148) and in Thailand (p. 149) soyabeans are cultivated.

"Plant introduction in Australia (C.S.I.R.O.): Almost immediately after the establishment of the Division of Plant Industry (then the Division of Economic Botany) in 1928, a Plant Introduction Section was formed to rationalize the introduction and testing of plants for all parts of Australia.

Among the many other plants discussed are peanuts (Arachis, p. 254-55), milk vetches (Astragalus, p. 255, incl. Genge), Derris (= Deguelia, p 268), kudzu (Pueraria, p. 317-21), including long sections on regular kudzu *(P. thunbergiana = P. hirsuta = P. triloba = Dolichos japonicus = Pachyrhhizus trilobus)* and on tropical kudzu or puero *(P. phaseoloides = P. javanica)*, and Voandzeia (the Bambarra groundnut, Madagascar peanut, Juga bean or earth pea; Voandzeia subterranea is a native of Africa). Address: Plant Production Branch, Agriculture Div., FAO, Rome, Italy.

508. **Product Name:** The Versatile Soyabean in Tomato Sauce.
Manufacturer's Name: F.G. Roberts' Health Foods.
Manufacturer's Address: 40 Chapel St., St. Kilda (a beach-side suburb of Melbourne), Victoria, Australia.
Date of Introduction: 1953.
Ingredients: Incl. soybeans, tomato sauce or puree.
Wt/Vol., Packaging, Price: Tin-plated steel can.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. Vincent R. Smith was a soyfoods pioneer in Australia. From 1953-54 to 1974-75 he canned soybeans in tomato sauce or puree. In 1956 he founded Soy Products of Australia Pty. Ltd.

Talk with Paul Smith. 1995. Feb. 20. The soybeans were soaked overnight, then pre-cooked in a steam-jacketed vessel. Then the cooked beans and tomato puree were put in can, the can was lidded, then the whole can was autoclaved, then labeled. Sanitarium Foods took a keen interest in this product, then copied the product from F.G. Roberts' Health Foods. Paul remembers how his company used to supply the product to the many Sanitarium retail health food stores. His father had a little creamy white Ford panel van with green stripes on the sides. They used it to deliver their products to places like The Original Nature, the first vegetarian restaurant in Melbourne, down in the basement in Little Collins Street. The restaurant served salads and grated carrots, and fresh squeezed carrot and celery juice, and fruit juices. They also made and served vegetarian burgers.

509. Pritchard, Florence; Pritchard, Edgar W. 1953. A scientific meatless diet: Being the principles and practice of lacto-vegetarianism based on the latest scientific discoveries, with original recipes. 4th ed. Marryatville, South Australia: Published by the authors. 19 p. 22 cm.
• ***Summary:*** Discusses the advantages of a lacto-vegetarian diet, with recipes.

Concerning soya beans, page 7 contains a paragraph which states: "These beans deserve much more attention than they have hitherto received... In China and Japan they are a staple food, being made into innumerable dishes including soya bean milk and cheese [tofu]." There are also recipes for Boiled soya beans (p. 9), and Soya bean rissoles (p. 11). Address: 31 Yeronga Ave., North Kensington Park, Marryatville P.O., South Australia.

510. Paddleford, Clementine. 1954. Dinner at Trader Vic's: Who ever heard of steak with pineapple? Here's an exotic secret from a famous West Coast kitchen. *Los Angeles Times.* Nov. 21. p. L16.
• ***Summary:*** Trader Vic is a famous name in San Francisco. In 1934 his name was Victor Bergeron; an auto parts salesman, he was tired of his job. Since his father was in the restaurant business, he thought he'd give it a try, investing his $500 of savings. He was an immediate success.

He opened his first restaurant (a mere shack with a tin roof, loaded with South Sea paraphernalia) as a trading post across the bay in Oakland. Two Chinese barbecue ovens were the chief equipment. It was famous for fabulous rum drinks, and for the Trader himself, hopping along on his wooden leg. Soon he began opening more shacks. Today the menu is called Polynesian, but it is actually Chinese–or perhaps uniquely his. A recipe for Skewered barbecued pineapple and steak calls for ½ cup soy sauce. A small photo shows Trader Vic. Address: *This Week* food editor.

511. **Product Name:** Sanitarium Health Foods Soya Beans in Tomato Sauce.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: Sydney, N.S.W., Australia.
Date of Introduction: 1954.
Ingredients: Soya beans, tomato, sucrose, salt, onion, paprika.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 1980, undated. "A delicious protein-rich vegetable." Two recipes on label. Recipe brochure. 1981, undated. "Imagination in cooking... with Sanitarium." Photos show: Canned Soya Beans in Tomato Sauce, Vegetarian Rediburger, Bologna, Tender Bits. Label. "Delicious protein-rich vegetable." Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product

introduction date as 1954. Ingredients now read: "Soya beans, sauce, water added."

Note: This is the earliest known commercial soy product made by Sanitarium Foods in Australia.

512. Wells, W.G. 1954. Regional experiment stations. *Queensland Department of Agriculture and Stock, Annual Report (Brisbane, Australia)* 109 p. For the year 1953-1954. See p. 41-45. *
• ***Summary:*** The Nanda soybean variety yielded well in several locations and was found most suitable for mechanical harvesting; the variety Clemson showed best resistance to bacterial leaf spot.

513. Bradbury, R.B.; White, D.E. 1954. Estrogens and related substances in plants. *Vitamins and Hormones* 12:207-33. (Academic Press, Inc., New York). [126* ref]
• ***Summary:*** Contents: Introduction. Tests on plant extracts. Isolation of estrogens: Palm kernels, willow catkins, *Butea superba,* subterranean clover *(Trifolium subterraneum),* other plants. Related plant products: Steroids, other hydrophenanthrene compounds, stilbenes, isoflavones. Synthetic compounds related to genistein: Isoflavones, isoflavanones, isoflavens. General summary.

The occurrence of plant substances capable of causing estrus in animals was first reported in 1926 (Lowe 1926; Dohrn et al. 1926; Fellner 1926) only three years after the development of the Allen-Doisy test (see Emmens 1950) had made it possible to estimate the effectiveness of different estrogens. Since then, many plant extracts have been reported to have estrogenic activity. Isoflavones were isolated from clover, and these natural yellow dyes were shown to be the cause of lambing problems from ewes grazing in clover. It was shown that the presence of 7-10 grams/day of genistein in ewe rations resulted in sterility or infertility of the female.

A table on p. 225 lists 8 plant species containing genistein, pruntein, or brochanin. Soybeans are included; four publications state that they contain "genistin." Page 230 states that the known plant estrogens are estrone, estriol, and genistein and its derivatives. Address: Dep. of Chemistry, Univ. of Western Australia, Nedlands, Western Australia.

514. Grasslands Agricultural Research Station, Marandellas. 1954? Annual report for the year ending 30th September, 1953. *Report of the Federal Ministry of Agriculture, Southern Rhododesia* p. 18-20. Undated. [7 ref]*
• ***Summary:*** In trace element and fertilizer trials with soybeans, the compounds were applied at sowing. Some seeds were inoculated before sowing with cultures from the Waite Institute, Australia. Inoculations resulted in an increase in most desirable parameters.

Note: The Grasslands Research Station is located 3.5 miles northwest of Marandellas in Southern Rhodesia.

515. Glidden Co. (The). 1955. Annual report, 37th for the fiscal year ended October 31, 1954. Cleveland, Ohio.
• ***Summary:*** Sales for the year were $209.083 million. Net earnings before taxes were $14.235 million. Net profit after taxes and all charges was $7.093 million. Dwight P. Joyce has replaced his father as president of the company. In 1954 Glidden sold its Indianapolis (Indiana) live stock and poultry feed business, but not the plant.

"Your Directors have approved the immediate start of construction of a 6.5 million-bushel terminal grain storage elevator to be located on the Calumet River in Chicago. The new elevator will be the second largest in the Chicago switching area and will cost more than $5 million. This additional capacity will be of material aid to our Chemurgy Division in its soybean crushing and grain merchandising operations located in Chicago and Indianapolis. The elevator is also advantageously located in relation to handling grain for export when the St. Lawrence Seaway is completed."

"During the year we were able to sell our full productive capacity of isolated protein, soya flour and lecithin products. We are now in the process of materially expanding this capacity and further major expansion is in the planning stage."

"We have adopted an aggressive marketing policy on Glidden 'RG' Soya Lecithin, a dietary source of choline, inositol and phosphorus. Present sales of this product are substantial even though it has not previously been advertised." An illustration shows a bottle of Glidden "RG" Soya Lecithin with a hand pouring soybeans into it and many people (no taller than the bottle) around it.

"We have licensed major paint producers in Australia, France, Sweden, Norway, Denmark, Belgium, Holland, Italy, Great Britain, Finland, Iceland, Japan and Cuba to manufacture Spred Satin and a number of companion lines."

"Without departing from our concept of decentralized divisional research, we established the Central Organic Research Laboratory in Chicago. This laboratory is engaged with projects in the field of organic chemistry and nutrition for our Chemurgy, Food and Paint Divisions. We plan to emphasize and expand our research work still further."

At the end of comments by Dwight P. Joyce, president, is a brief obituary ("In Memoriam") for Adrian D. Joyce (1872-1954), founder of The Glidden Company, which "pays tribute to a man who achieved greatness in his career and as a human being." Address: Cleveland, Ohio.

516. **Product Name:** Soybake (Roasted Full-Fat Soya Flour).
Manufacturer's Name: H.J. Langdon. Made in Melbourne, Australia, by F.G. Roberts' Health Foods.

Manufacturer's Address: Australia.
Date of Introduction: 1955.
Ingredients: Soybeans.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 14. "Soyvita has only ever been used as a tradename for debittered full fat soy flour since 1951. Initially it was made using imported soybeans, but from 1954 it was made from Australian-grown soybeans. The tradename 'Soybake' was used for the same product packaged under the H.J. Langdon's name and address from 1955 to mid-1991, when it was abandoned due to a rationalisation of packaging and product lines. H.J. Langdon now buys the product in the 'Soyvita' packaging."

517. *Queensland Department of Agriculture and Stock, Annual Report (Brisbane, Australia).* 1955. Crop trials, Biloela. 99 p. For the year 1954-1955. See p. 40-41. *
• ***Summary:*** The soybean varieties Clemson and Rose Selection No. 2 outyielded Nanda. Rate-of-seeding trials indicated that plant population per row foot was more important than the variations between the 27, 34, and 42-inch row-spacings.

518. Farrer, K.T.H. 1955. The thermal destruction of vitamin B-1 in foods. *Advances in Food Research* 6:257-311. See p. 290. [231* ref]
• ***Summary:*** In the section titled "Losses in processing vegetables," page 290 states that (according to Miller 1945) when soybeans are pressure cooked for 60 minutes at 121ºC, they loose about 74% of their thiamine content. Address: Research Laboratories, Kraft Foods Ltd., Melbourne, Australia.

519. Gray, S.G. 1955. Experiments with soybeans in Australia. *Division of Plant Industry, Technical Paper (Australian Commonwealth Scientific & Industrial Research Organization)* No. 4. 18 p. [12 ref]
• ***Summary:*** Report on soybean growth feasibility study for Australia. Summarized the early soybean research done by CSIRO and emphasized the importance of considering homo-climes in the introduction of soybean varieties for sub-tropical Australia. Over 300 soybean introductions were tested in trials in several parts of Australia from 1944 to 1951. Results of trials at Katherine (Northern Territory), Redlands Bay (Queensland), and Redcliffs (Victoria) showed that there is a constant relationship between relative maturity of varieties and latitude. The most suitable varieties at each locality were those originating from comparable latitudes overseas. The author recommends that varieties from eastern and northern Australia should be sought in regions of lower latitude than those of the major soybean areas of the world. Address: CSIRO, Melbourne.

520. Bowen, G.D. 1956. Nodulation of legumes indigenous to Queensland. *Queensland J. of Agricultural Science* 13(1):47-60. March. [34 ref]
• ***Summary:*** The author reports nodulation in *Glycine clandestina* Wendl., *Glycine tabacina* (Labill.) Bentham (=*G. koidzumii* Ohwi), and *Glycine tomentella* Hayata (=*G. tomentosa* Benth.) in Australia. He places the soybean in the group of introduced legumes of the cowpea miscellany nodulating naturally in various parts of Queensland. Address: Asst. Pathologist, Div. of Plant Industry.

521. Schwitzer, M.K. 1956. Margarine and cooking fats: Their history and world trade. I (Document part). In: M.K. Schwitzer. 1956. Margarine and Other Food Fats: Their History, Production and Use. New York, NY: Interscience Publishers, Inc. 385 p. See p. 59-78. Chap. 2. [52 ref]
• ***Summary:*** Contents: The invention of margarine in France. Other countries follow. The coining of a new word. The history of cooking fat [shortening]. Impact of fat hydrogenation. Recent expansion in margarine consumption. Consumption levels of margarine (per capita). Present world trade in margarine. The production of cooking fats (shortenings).

Margarine was invented in France in 1869 by the French chemist-turned-business man, Hippolyte Mège-Mouriés. Production started at Poissy in about 1872-73. In other European countries, margarine production started as follows: Netherlands in 1871, by the Jurgens and Van den Berghs in the little village of Oss; Denmark 1870-71, by Otto Monsted, Denmark soon had the highest per capita margarine consumption; Austria-Hungary 1873-74, in Liesing near Vienna; Germany 1875; United Kingdom 1889–Otto Monsted established England's first margarine plant in an old hat factory in Godley, Manchester. Demand was so great that he had to erect a new factory in Southall near London. Production began in March 1895 at the rate of more than 1,500 tons/week. The word 'margarine' was first used by Mège's teacher, Michel Eugène Chevreul, around 1813. At a meeting of the French Academy on 13 July 1813 Chevreul reported on a fat-like substance that he had prepared and which he named margarine or margaric acid

Page 59 states: "When Napoleon III had offered a prize in 1869 for a butter substitute that would be cheaper and would keep better than cows' butter, Mège was an easy winner, as by then he had produced a satisfactory product. A factory was installed in Poissy, but manufacture did not get under way until after the Franco-Prussian war of 1870-71 [in which France under Napoleon III was defeated by Prussia under Bismark]. The way was not clear, however, until Félix Boudet, a distinguished chemist retained by the French health authorities for the purpose, had reported favourably on the new product. On 12th April, 1872, a regulation was passed permitting the sale of margarine, but it was not to be called butter. Mège promptly formed the

'Société Anonyme d'Alimentation' with a capital of 800,000 francs. Large scale production started in 1873."

The Mège patent in the USA, issued in May 1874, was purchased by the United States Dairy Co., which hired Henry A. Mott to improve on Mège's method. A number of U.S. margarine patents were issued in the following years. Many of these suggested the use of lard or vegetable fats instead of oleo oil. One of the improved methods was used by the Commercial Manufacturing Co. in New York, which soon became America's largest margarine manufacturer.

Margarine was introduced to the USA after the Civil War, when the country was undergoing profound economic changes. Farmers strongly resisted the introduction of margarine, believing that it would compete with the butter made on their farms.

The word "margarine" was coined by Mège's teacher, Michel Eugène Chevreul, in about 1813. At a meeting of the French academy on 13 July 1813 Chevreul reported on a fat-like substance that he had prepared and which he named margarine or margaric acid. The name was derived from the Greek word for pearl *(margarites)* He gave its chemical formula as $C_{17}H_{34}O_2$ What Chevreul thought to be a new substance was, in fact, a mixture of palmitic and stearic acids.

Since Mège's crystalline substance had a pearly luster, he gave the soft portion of the tallow, expressed after digestion, the name oleo-margarine, since he believed it to be a mixture of oleine and margarine.

As in the Greek root the *g* is pronounced hard like the *g* in garlic; it is incorrect to pronounce margarine as marjarine, as if the g were replaced by j.

In England, margarine (imported from Holland) was first sold under the name of Butterine. This name was dropped in 1887 after Parliament passed the first Margarine Act (p. 63).

The histories of margarine and cooking fat [shortening] are closely connected. "Whereas all the important developments in the early history of margarine took place in Europe, the first significant pages in the history of cooking fat were written in America. It is ironical that one of the largest lard-consuming and exporting countries [USA] should have been the first to turn to an alternative. There is here a parallel with Denmark, which as the biggest exporter of butter had the highest *par caput* consumption of margarine. The new lard substitute was called 'compound' lard or 'shortening' in the United States; both were misnomers. There was often very little or no lard present, nor was the new product used only for baking purposes where 'shortness' was required. Compound fat or cooking fat are more correct designations" (p. 63).

"The introduction of hydrogenation into fat technology can be regarded as the re-birth of the margarine and cooking fat industries... No more was it necessary to rely on animal fats which were available only as by-products of the meat-packing and dairy industries." In 1902 Normann announced that he had hardened a liquid fat by hydrogenating it with a catalyst. Early commercial success was expected. Patents were applied for in Germany by a plant engineering firm (Leprince and Sivke; German Patent No. 141,029, of 1902) and by Normann himself in the United Kingdom (No. 1,515, or 1903). Normann's work was based on earlier experiments by Varentrapp (1840), Sabatier, Senderens, and others. The first large-scale hydrogenation plant began operations in 1906 in England, at Crosfield's factory in Warrington. In Germany the Oelwerke Germania, at Emmerich on the Rhine, started a plant for hydrogenating whale and linseed oils. Several years later, Procter & Gamble Co., Cincinnati, Ohio, began commercial hydrogenation in the USA.

Canada: Recent developments with margarine in Canada have followed those in the USA. In 1948 the Supreme Court rules that the provisions of 1935 Dairy Industry Act relating to margarine were invalid; in 1949 margarine was first produced in Canada. By 1952 margarine production had reached 47,000 tons, making Canada the second largest margarine producer in the British Commonwealth, after Great Britain. Address: Highgate, UK.

522. Schwitzer, M.K. 1956. Margarine and cooking fats: Their history and world trade. II (Document part). In: M.K. Schwitzer. 1956. Margarine and Other Food Fats: Their History, Production and Use. New York, NY: Interscience Publishers, Inc. 385 p. See p. 59-78. Chap. 2. [52 ref]
• ***Summary:*** Tables: Table 8 (p. 67) shows margarine production in major countries worldwide in 1938, and 1946 to 1953. The countries are: United Kingdom, Australia, Canada, South Africa, British Caribbean, Austria, Belgium, Denmark, Finland, France, Germany, Israel, Japan, Netherlands, Norway, Poland, Soviet Union, Sweden United States. Production in these countries totaled 1,350,000 tons in 1938, dropping to 949,000 tons in 1946, then rising steadily to 2,618,000 tons in 1953. In 1938 Germany was by far the leading producer (439,000 tons), followed by United Kingdom (208,000), and USA (172,000). In 1953 the three largest producers were USA (577,000 tons), Germany (573,000), and United Kingdom (406,000). Holland was the world's largest margarine exporter.

Page 69: Graph of per capita consumption of margarine and butter in the UK and USA, 1938-1953. During this time, butter consumption decreased and margarine consumption increased in both countries. In the UK, per capita consumption of both margarine and butter are higher than in the USA, and margarine consumption passed that of butter in the mid-1940s.

Page 70: Estimated per caput consumption margarine in major countries worldwide in 1938, and 1946 to 1953. The countries are: United Kingdom, Australia, New Zealand, Canada, Norway, Netherlands, Sweden, USA, Finland, Denmark, Western Germany, and Belgium. Clearly Europeans, and especially those in Scandinavian or northern European countries, are the leading margarine consumers. In 1938 the leading countries were Denmark (47.4 lb/capita), Norway (141.2), and Sweden (10.5); USA was 2.9. In 1953 the leaders were Norway (51.1), Netherlands (40.8), and Denmark (40.1); USA was 7.9.

Page 71. Fats used in the production of margarine in the United Kingdom (1937-1953; soy oil started in 1951 and is insignificant). In 1938 UK margarines were made from 53% vegetable oils (groundnut was the leader, followed by coconut), 41% marine oils, and 6% animal fats. In 1953 UK margarines were made from 91% vegetable oils (groundnut was still the leader, followed by coconut), 8.8% marine oils, and 0.2% animal fats.

Page 72: Fats used in the production of margarine in the USA (1938-1953; soybean oil passed cottonseed oil in 1951). In 1938 U.S. margarines were made from 93.6% vegetable oils (cottonseed was the leader, followed by coconut then soybean oil), and 6.3% animal fats. In 1953 U.S. margarines were made from 98.9% vegetable oils (soybean oil was now the leader, followed by cottonseed), and 1.1% animal fats.

Page 73: Fats used in the production of margarine in certain countries (1937-1952) In 1951-53 soybean oil comprised the following percentage of all oils used to make margarine is these countries: Australia 0%, Canada 50%, Denmark 5%, Netherlands 5%, Norway 3%, Sweden 0%.

Page 75: Production of cooking fat (shortening), 1938, and 1946-53, in the UK, Canada, Germany, and USA. World production of "lard substitutes" is considerably smaller than that of margarine, and the USA and the UK are the only major manufacturers. Total production in these countries grew from 868,000 tons in 1938 to 1,075,000 tons in 1953. In 1953 the leading producers were USA (748,000 tons), United Kingdom (209,000 tons), and Canada (61,000 tons). In Germany shortening is called *Plattenfett* and *Kunstspeisefett*.

Page 76. Fats used in the production of cooking fat in the UK (1937-1953; soy is not mentioned).

Page 76: Fats used in the production of cooking fat in the United Kingdom (1937-1953; soybean oil is not mentioned).

Page 77: Fats used in the production of cooking fat in the USA (1938 and 1946-1953; soybean oil had passed cottonseed oil by 1946). In 1938 U.S. shortenings were made from 91.7% vegetable oils (cottonseed was by far the leader, followed by soybean then palm oil), 8.2% animal fats, and 0.1% marine oils. In 1953 U.S. shortenings were made from 18.6% vegetable oils (soybean oil was now by far the leader, followed by cottonseed), and 16.2% animal fats (mostly lard). Address: Highgate, UK.

523. *Soybean Digest.* 1957. Soybean Lab in study of tropical plants. May. p. 35.

• ***Summary:*** Nine species of tropical plants closely related to soybeans are being studied at the University of Illinois by research workers at the U.S. Regional Soybean Laboratory. Most of the plants are perennial vines. A photo shows Richard Bernard examining one of the plants. The plants, which have come from the Belgian Congo, South Africa, Southern Rhodesia, Kenya, Nigeria, Australia, Formosa [Taiwan], and Malaya, may have disease resistance that might be bred into regular soybeans. The leaves and flowers of these plants are similar to those of regular soybeans. The seeds form in pods but are much smaller than regular soybeans.

Note: These are probably wild perennial Glycine species.

524. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1957. Section III–Work of the Department. For the year 1957. See p. 8, 13.

• ***Summary:*** Under "Demonstration farms" we read (p. 13): "65. Legumes. Yield of up to 15 cwt. [1 cwt = hundredweight = 112 pounds] per acre of peanuts (Spanish bunch) have been obtained... Melanesians find them very palatable. Soya beans introduced from Fiji failed to germinate..."

Note 1. This is the earliest document seen (March 2010) concerning soybeans in the Solomon Islands, or the cultivation of soybeans in the Solomon Islands. This document contains the earliest date seen for soybeans in the Solomon Islands, or the cultivation of soybeans in the Solomon Islands (1957). The source of these soybeans was Fiji.

Note 2. The British Solomon Islands Protectorate consists of six large islands or island groups, four smaller islands, and a few outlying islands. They are located due east of Papua New Guinea and northeast of Australia. The total land area is about 11,500 square miles. The population consists mainly (95%) of Melanesians, plus Polynesians, Micronesians, Chinese, Europeans, and others. Includes the islands of Guadalcanal, Malaita, San Cristóbal, Choiseul, Santa Isabel, and Florida.

525. Abrahams, M.M. 1958. Soy food (MPF) offers challenge to world hunger: Meals for Millions Foundation proposes international conference to review the problem of world hunger. *Soybean Digest.* May. p. 20, 22.

• ***Summary:*** Meals for Millions Foundation offers a scientifically developed dietary soybean product, Multi-Purpose Food (MPF), to help relieve malnutrition and hunger. "But this is merely a part of a much larger purpose that has animated the Foundation's 11-year efforts, efforts that are completely unendowed and without government aid, but supported by the penny-power contributions of thousands of free Americans.

"The larger aims of the Foundation's program and product such as creating good will for the United States and relieving starvation were recognized in the two awards the Foundation received in 1956 and 1957 from Freedoms Foundation. These aims are evidenced by the collaboration now being accorded by such agencies such as USIA, ICA, FAO, UNICEF and the President's People-to-People program."

Meals for Millions Foundation was incorporated in 1946. More than 95% of the bulk of MPF is soybean grits. The scientific explanation for the way this dietary supplement works is "synergistic action." "This means that MPF provides not only its own concentrated protein, vitamin and mineral values but, in addition, increases substantially the biological value of the food to which it is added, even in very small quantities."

Photos show: (1) "Before: These six malnourished babies were admitted to the American hospital, Pago Pago, Samoa, by Dr. James R. Dean, public health officer. (2) After: Same babies as in first picture after 6 months diet of Multi-Purpose Foods. All showed gains of weight into the normal range. All showed improvement in motor response and bodily tone."

Example #1: A trial with two groups of 20 workmen in a factory in Sao Paulo, Brazil, showed that the group receiving MPF increased its relative production rate 10% above the control group. The men in the group also gained on average more than 2.5 pounds per man.

Example #2: Miss Gladys Oberlin, the American nutritionist–directress of Instituto Ana Gonzaga, a Methodist missionary school in Rio de Janeiro used MPF to supplement the diet of 200 girls in her boarding school. Their usual meals were the standard but simple rice and beans for both lunch and dinner. At the end of 3 months Miss Oberlin reported that it actually cost less to feed the girls with MPF than without it. Moreover, the infirmary has been vacant for much of this test period. Yet the average daily amount of MPF that each girl received was only a little more than ¼ ounce.

Another photo shows: "Approval to Meals for Millions affiliate program in his state is given by Governor Janio Quadros of the state of Sao Paulo, Brazil." At right is Maurice M. Abrahams of the Meals for Millions Foundation. Address: Brazilian representative for Meals for Millions Foundation.

526. Bergersen, F.J. 1958. The bacterial component of soybean root nodules; changes in respiratory activity, cell dry weight and nucleic acid content with increasing nodule age. *J. of General Microbiology (England)* 19(2):312-23. Oct. [17 ref]

• ***Summary:*** During the 6-7 week active life of soybean root nodules produced by a single strain of *Rhizobium japonicum*, the respiratory activity of the bacteria isolated from the nodules changed according to a definite pattern; a depression appeared after the nodules first appeared followed by a rise, and with a further sharp rise 1 week before nodule breakdown. The initial depression coincided with the beginning of nitrogen fixation. The limits within which respiration varied depended on host-plant growth. The nitrogen fixation rate remained constant from 2-3 weeks after nodule appearance until a few days before nodule decay began. The word "bacteroids" is used many times to refer to non-proliferating cells. In "these studies the term 'bacteroid' will be used irrespective of external morphology for the non-proliferating intracellular forms of Rhizobium found in the bacterial tissue of the root nodules, in order to distinguish the somewhat unique function and properties of these forms from those of the free-living and cultured forms of the bacteria." Address: Div. of Plant Industry, CSIRO, Canberra, Australia.

527. **Product Name:** Sanitarium Health Foods Vegecuts (Vegetarian Steaklets).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1958.
Ingredients: Wheat protein, casein, soya beans, peanuts, cornflour, Marmite, onion powder, salt, monosodium glutamate, sucrose, curry.
Wt/Vol., Packaging, Price: 1 lb can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. "Vegetable Protein–Ideal for grills, casseroles, stews, salads." Recipes for Vegecuts Ambrosia and Sukiyaki.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1958.

Note: This is the earliest soy product seen that uses casein as an ingredient.

528. **Product Name:** Sanitarium Health Foods Vegetarian Sausages.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1958.
Ingredients: Wheat protein, peanuts, tomato, soya beans, Weet-Bix, dried yeast, Marmite, herbs, cloves.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. Photo shows frankfurter-like sausages on a bed of rice.

"Vegetable Protein" Recipes for Sweet & Sour Sausages and Sesame Veg-Sticks.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1958.

529. Amaral, C.J.; van Veen, A.G. 1958. Appendix: National average food supplies. In: A.M. Altschul, ed. 1958. Processed Plant Protein Foodstuffs. New York: Academic Press. xv + 955 p. See p. 893-96. [2 ref]

• ***Summary:*** Table I shows the estimated per capita consumption of animal and vegetable protein in all countries which maintain food balance sheets (47 countries are listed with the total population and the consumption of animal and of vegetable protein, in grams per person per day). Fig. 1 is a map of the world that shows the caloric content of national average food supplies. There are four categories: 1. Over 2,700 calories per capita per day (includes most industrialized countries). 2. Between 2,700 and 2,200 calories. 3. Under 2,200 calories. 4. Data not available. Figure 2 is a pie chart (dated Nov. 1952) showing that 58% of the world's population consumes lass than 15 grams per person per day of animal, 17% consumes 15-30 grams, and 25% consumes over 30 grams. Table II shows estimated protein consumption of the world population. Address: 2. Nutrition Div., FAO, Rome, Italy.

530. Bergersen, F.J.; Briggs, Margaret J. 1958. Studies on the bacterial component of soybean root nodules: Cytology and organization in the host tissue. *J. of General Microbiology (England)* 19:482-490. Plus 4 unnumbered pages of black and white photos at end. [17 ref]

• ***Summary:*** "Light- and electron-microscope studies of bacteroids in soybean nodule sections and suspensions of isolated bacteroids have shown well-defined nuclear elements, containing tangles filaments and dense granules."

Bacteroids and bacteria are distinguished as follows: "In continuing the study of the bacterial component of soybean root nodules, the term 'bacteroid' is again used to denote the non-proliferating found in large numbers in the cytoplasm of the cells of the central tissue of mature nitrogen-fixing nodules; earlier proliferating stages in proliferating nodules are referred to simply as bacteria."

Figures show: (1) Labeled illustration of cytological features of the two types of bacteroids separated from mature nitrogen-fixing soybean root nodules. (2) Three diagrammatic representations of the membrane system enclosing the bacteroids in soybean root nodules. Objects labeled include: c = host cell cytoplasm. cell. = cellulose of the host cell walls. inf.thr = lining infection threads made of cellulose. m = membrane envelope around bacteria, and initially continuous with the infection thread membrane and host cell membrane. n = host nucleus. b = bacteria. t = interconnecting membrane tubule. Address: 1. Div. of Plant Industry, CSIRO, Canberra, Australia.

531. Clinkard, Charles Ernest. 1958. Soya–The wonder food. 4th ed. Auckland, New Zealand: C.E. Clinkard & Co. 32 p. Illust. 22 cm. *

• ***Summary:*** The author was born in 1883. Address: New Zealand.

532. *Soybean Digest.*1959. Some soybean acres planted in Australia. Aug. p. 42.

• ***Summary:*** About 1,500 acres of soybeans have been planted in Australia this year, according to the USDA Foreign Agricultural Service. "This is the first commercial planting of soybean there, although experimental plots have been grown. A government program is encouraging new crops, and unofficial reports indicate increasing attention to oilseed production in order to reduce import needs of fats and oils."

Note: This is the 2nd earliest document seen (July 2007) that gives soybean production or area statistics for Australia, or for any country in Oceania.

533. Bligh, John E. 1959. Soybean growing in Australia. *Soybean Digest.* Sept. p. 68.

• ***Summary:*** The author has been a soybean pioneer in Australia. He has grown them on his farm named Anchorfield on the Darling Downs in Queensland, Australia. Modern seed drilling machinery has made it possible for Australia this year to produce about 25,000 bushels of soybeans on 1,500 acres. He foresees a major expansion of soybean cultivation on the Darling Downs during the next few years. The seed is planted in mid-November and harvested after 130 to 150 days in the early summer.

In Australia soybeans are used almost exclusively for full fat flour in the manufacture of bread. A photo shows Bligh. Address: Anchorfield, Brookstead, Darling Downs, Queensland, Australia.

534. *Ha'aretz (Israel).*1959. Remarkable achievements of the "Herzlia" soybean. Nov. 4. Economic column. *

• ***Summary:*** About Eliahu Navot, Israel's soybean pioneer, one of the first settlers of Herzlia. He is amically [sic, amicably] referred to as 'the soybean monomaniac,' and he developed this variety.

"Mr. Navot has brought the seeds with him from a soybean study tour which took him to many countries in Europe, America and Australia. The seeds, which have been acclimatized in Mr. Navot's private farm originally came from California. Following ten years of breeding and selection they are now distributed to farmers as well as to 'Yizur uFituah', a cooperative society running several large farms...

"During the Second World War, Prof. Weizmann told workers of the Agricultural Research Station at Rehovot that the successful cultivation of soybeans has priority over the production of cannons, because whereas cannons are of no use as a source of soybeans, soybeans may be turned into cannons. Yet the major use of soybean is food, as it is extremely nutritious."

Immediately after this article was published, a spate of other articles appeared.

535. Thaine, R.; Ovenden, S.L.; Turner, J.S. 1959. Translocation of labelled assimilates in the soybean. *Australian J. of Biological Sciences* 12(4):349-73. Plus 3 pages of plates unnumbered end. [13 ref]

• ***Summary:*** When radioactive carbon dioxide "was supplied to a limited area of a mature illuminated leaf of soybean, the radioactive compounds appeared rapidly in the root, the apex of the shoot, and in young unexpanded leaves. Translocation to these 'sinks' took place in the light, during photosynthesis at the source.

"Translocation also went on in darkness subsequent to fixation in the leaf,..."

The movement of assimilate from the source leaf to any other leaf can take place because of the soybean's vascular pattern. It was shown clearly that tagged assimilate can move into a mature leaf when necrotic spots appeared on the leaf–presumably due to nutrient imbalance. Address: Botany School, Univ. of Melbourne.

536. Canterbury Agricultural College. 1959. Soya bean trials (I.D. Blair and Miss A. Bennett). *Canterbury Agricultural College, Annual Review (Lincoln, New Zealand).* p. 70-72. For the year ending 30th June 1959.

• ***Summary:*** "By arrangement with the Field Crop Committee (D.S.I.R.) it was decided to make a re-appraisal of the possibility of growing the soya bean under New Zealand conditions. An unfavourable report was made on this crop 20 years ago (M.A. Black. 1939. "Soya beans." *New Zealand J. of Science and Technology* 21(1A):46a-60a. June), but it is believed that the availability now of new varieties developed for New Zealand latitudes could alter the prospect. In addition, the factor of seed inoculation using strains of *Rhizobium japonicum* could also be important. Two field trials were conducted, one at the Canterbury Agricultural College, and an identical one at the Rukuhia Soil Research Station, Hamilton (Department of Agriculture).

The seed of 9 varieties was obtained from Iowa and Minnesota, USA: Capitol, Chippewa, Norchief, Grant, Harosoy, Lincoln, Hawkeye, Black Hawk, Adams. Under dry conditions and relatively low soil fertility, yields ranged from 21.6 to 35.7 bushels/acre. Further studies are planned, with special attention to inoculation with rhizobia bacteria. Address: Dep. of Agricultural Microbiology.

537. Department of Territories, Canberra. 1959. Chapter 2.–Agriculture and livestock. *Commonwealth of Australia, Territory of Papua, Annual Report (Canberra, Australia).* p. 34-46. For the period 1 July 1958 to 30 June 1959. See p. 33-34, 44.

• ***Summary:*** In this chapter, in the section titled "Plant pathology and microbiology," we read (p. 44) that *Rhizobium* inoculum is now available for soy bean *(Glycine max)*, peanut, and other legumes.

538. FAO (Food and Agricultural Organization of the United Nations), Plant Production. 1959. Tabulated information on tropical and subtropical grain legumes. Rome, Italy: FAO. xiv + 367 p. 28 x 21 cm.

• ***Summary:*** This publication was compiled from the replies of questionnaires submitted to agricultural stations, or other organizations, in tropical and subtropical countries. Information is given on morphology and habit, uses, yield, and quality of grain and/or forage. Among the many species considered are soybeans, peanuts, winged beans, and bambarra groundnuts *(Voandzeia subterranea)*. An appendix gives the geographical location of the contributing stations and countries, together with data on local temperature, precipitation and soil type. This work is in English, only, but French and Spanish equivalents of the headings are given.

Page vii shows the various countries from which information on the cultivated soybean was collected. At least one page is devoted to the soybean in each of these countries, as follows: (1) Angola (p. 90). Local name: Soja Preta. Station submitting information: Estacao Agricola Central, Vila Salasar. Seed yield: 1,400 kg/ha. Uses: Green manure, human consumption, livestock feed, oil extraction. Angola #2 (p. 107). Station submitting: Estacao de Melhoramento de Plantas, Nova Lisboa for variety Medium Yellow. Seed yield: 500–2,500 kg/ha. Uses: Human consumption, livestock feed, oil extraction. (2) Belgian Congo (p. 91). Station submitting: I.N.E.A.C. Station, Gandajika. Seed yield: 260-850 kg/ha. Use: Human consumption. (3) Jamaica (p. 92). Station submitting: Department of Agriculture, Kingston. Seed yield: 1,080 kg/ha. Uses: Green manure, human consumption, livestock feed. (4) Puerto Rico (p. 93). Local names: Habichuela Soya, Haba Soya. Station submitting: U.S. Federal Agricultural Experiment Station, Mayaguez. Seed yield: 1,620–2,160 kg/ha. Uses: Green manure, human consumption, livestock feed, oil extraction.

(5) Southern Rhodesia (p. 94). Station submitting: Agricultural Experiment Station, Salisbury. Seed yield: 1,500 kg/ha. Uses: Human consumption, livestock feed. (6) Thailand (p. 95). Local names: Tua Luang, Tua Nao, Tua Mei Tai. Station submitting: Mehjo Agricultural Experiment Station, Mehjo. Seed yield: Not given. Uses: Human consumption, livestock feed, oil extraction. (7) Belgian

Congo (p. 96-98, 100, 102, 104, 105, 108, 109, 112, 113). Local names: Soja. Stations submitting: I.N.E.A.C., Yangambi for varieties 37/S/38/345/666 (introduced from South Africa), Atootan (Otootan; introduced from Brazil), Jubitan 109 (introduced from Southern Rhodesia), Palmetto (introduced from Brazil), and Trinidad (introduced from Nigeria), I.N.E.A.C. Station, Nioka, Ituri for varieties Atootan SH. 030 and Herman SH. 02 (both introduced from USA), INEAC Station, Bambesa for varieties E.35 and S.H.E. 43, I.N.E.A.C. Station, Keyberg, Elisabethville for variety K 92/6/2/2/1, I.N.E.A.C. Station, Mont Howa, Ituri for variety Mammoth, I.N.E.A.C. Station Rubona, Ruanda for variety Palmetto. Seed yields: 1,000–1,500 kg/ha (2 varieties at Yangambi), and 500 kg/ha at Nioka. Uses: Green manure, human consumption, livestock feed, oil extraction. (8) Australia (p. 99). Station submitting: Department of Agriculture and Stock, Brisbane, Queensland for variety Clemson Non-shatter. Source of crop: Introduced from the USA. Seed yield: Not given. Uses: Human consumption, livestock feed, oil extraction.

(9) Morocco (p. 101). Station submitting: Centre de Recherches Agronomiques for variety Gibson S.C. 335. Seed yield: 400-500 kg/ha. Uses: Green manure, human consumption, livestock feed, oil extraction. (10) Brazil (p. 103). Station submitting: Instituto Agronomico, Campinas, Sao Paulo. Variety name: I.A.455. Seed yield: 1,200–1,600 kg/ha. Uses: Erosion control, green manure, human consumption, livestock feed, oil extraction. (11) India (p. 110). Station submitting: Department of Agriculture, Nagpur, Madhya Pradesh for varieties S.B. 5 and S.B. 8. Seed yield: 1,486 and 1,172 kg/ha. Uses: Livestock feed. (12) Ceylon (p. 114). Station submitting: Agricultural Research Station, Maha Illupallama for variety Yellow (introduced from India). Seed yield: 860–1,080 kg/ha. Uses: Green manure, livestock feed, oil extraction. Address: Rome, Italy.

539. Kerr, J.A. 1960. Growing soybeans in Queensland. *Queensland Agricultural Journal* 86(3):153-57. March 1. Summarized in Soybean Digest, Jan. 1962, p. 31.
• ***Summary:*** Contents: Introduction. Soybean plant. Varieties (Nanda, Yelnando, Clemson non-shatter, and Pelican are most promising for commercial seed production; Avoyelles, Otootan, and Gatan for green manure or fodder). Time of planting. Planting. Depth of planting. Hay stands. Crop cultivation. Damage by hares and wallabies. Harvesting. Yields. Storage of seed. Soybean hay. Green fodder or ensilage. Crop prospects.

"The Queensland Department of Agriculture and Stock has been working for 25 years [i.e., since about 1935] on the selection and testing of soybeans in the South Burnett district."

"Soybeans have been produced in commercial quantities in Queensland for the past 10 years and there are indications that the acreage planted will expand considerably during the next few years" (p. 157).

The plant breeding program conducted by the Department of Primary Industries at Kingaroy resulted in the adaptation of several progenies and varieties, including Nanda. Yields of 36 bu/acre have been harvested from commercial stands in South Burnett, but the average is about 15-18 bu/acre. Yields from irrigated areas will normally exceed yields from rain-grown crops by up to 50%.

A photo shows soybeans being harvested with an autoheader.

Note from Paul Smith of Soy Products of Australia Pty. Ltd. 1995. April 11 (p. 2). "Archie Kerr was a well know agronomist who was extremely active in the Kingaroy areas. In the late 1940s and early 1950s the farmers in Kingaroy were particularly progressive and innovative, pioneering the growing of navy beans, haricot beans, peanuts and soybeans–urged on by people like Kerr and my father" [Ron Smith of SPA]. Address: Plant breeder, Queensland Dep. of Agriculture, Australia.

540. Division of Plant Industry, Commonwealth Scientific and Industrial Research Organization, Australia. 1960. The site and mechanism of nitrogen fixation in legume nodules. *CSIRO Research Review.* p. 46-48. For the year ending 30 June 1960. Undated.
• ***Summary:*** Radioactive nitrogen-15 was used in an experiment to find its distribution in centrifugal fractions of soybean nodules which had been exposed to labelled atmospheres; this nitrogen appeared first in the host membranes which enclose the bacteroids. The bacteroids were not labelled. The initial steps of nitrogen fixation appear to occur in those membranes from which nitrogen passes into the soluble fraction.

541. Soybean Council of America Inc. Israel Office. 1960. The story of Eliahu Navot: The soybean pioneer of Israel. Jerusalem, Israel: SCA. 36 p. Undated. Portrait. Many photos. 25 cm.
• ***Summary:*** Contents: Introduction. The life of E. Navot: "Eliahu Lipovitsky, as he was called before he adopted the Hebrew name Navot, was born in 1894 at Uman in the Ukraine. He immigrated in 1912 and, like all other youngsters who came to Palestine–then part of the Ottoman Empire–he became a hired labourer and guard." At that time the kibbutz (the communal settlement typical of Israel) was beginning to take shape, and various organizations, such as the World Zionist Federation, were founding agricultural farms.

Shortly after World War II he obtained his first soybean seeds from Mr. Mason (then Director of the Dept. of Agriculture in the British Mandatory Administration). He met Prof. Haim Weizmann, the first President of Israel and in 1949, with his encouragement, left on a study trip around the world, collecting seeds, living with soybean farmers, and learning how to prepare soybeans for human consumption. In Asia, he first saw soybeans grown on a large scale. He visited Malaya, Singapore, Australia, Fiji, Hawaii, and California.

In 1950 he returned to Israel with scores of varieties of seeds and proceeded to plant them in his experimental plots near his home in Herzlia [Herzliya / Herzliyya]–located just north of Tel Aviv. A soybean variety named Ogden [later renamed Herzlia] performed the best. His goal was finding ways to feed the people, and he developed and served many recipes. His work received widespread publicity. One especially gratifying article was published in the official organ of the Israel army; it called him the "Father of the Israel Soybean" and included a photo of him dancing the hora (a circle dance). Another fascinating report was published in "Eitanim," an important monthly devoted to health and hygiene. Soon Navot began lecturing on his pet crop, extolling its many virtues. "When the American Soybean Council began to operate in Israel, Navot was one of the first to offer his services."

The private war of Eliahu Navot: "As early as 1953, Navot published in *Hassadeh,* the major Hebrew journal devoted to agriculture, a technical article summing up his own experiments aimed at the acclimatization of the soybean in Israel. That article evoked great interest, but Navot was not satisfied with the opportunities provided by the press and other public bodies and launched a private campaign aimed at that bastion of conservatism, the kitchen. By means of pamphlets, circulars and manifestoes he was out to convince his fellow-citizens that the soybean well deserves a place of honour among the staple foods of the Israeli family.

"Some of the mimeographed pamphlets written by Navot in the course of his campaign are given below:"

The soybean in Israel and the world. The nutritive value of the soybean. The soybean–Food for millions. The soybean–A source of nutrition for millions (discusses Clifford Clinton and Meals for Millions). The cultivation of soybean in Israel. Soybean sprouts (variety Herzlia). Soybean drinks (soy coffee). Remarkable achievements of the "Herzlia" soybean.

Photos show: (1) Eliahu Navot (full page portrait photo). (2) E. Navot with four of his grandchildren. (3) E. Navot riding on his horse during the 1936-1939 disturbances. (4) Navot's first prize certificate as a cattle grower received at the 1936 Levant Fair. (5) Navot wearing a hat, sunglasses, and medals, and smoking a pipe. (6) Navot dancing the "hora." (7) Navot's medals. (8) Navot among the founders of the "Histadrut"–the General Federation of Labour in Israel. (7) A smiling girl with a plate of soyfoods. (8) Navot with cupped hands holding soybeans he has grown. (9) Navot in Herzlia holding a bunch of soybean plants, heavily laden with pods, grown in Israel. (10) A wedding feast where all the dishes served were made with soybeans. (11) Navot standing behind a table as he preaches at one of his soya dinners to a group of agricultural school teachers at Kfar Ata. (12) Navot distributes his soya felafels to a group of children with outstretched arms. (13) Navot, the soybean pioneer in Israel, shakes hands with Ogden Reid, U.S. Ambassador to Israel, as George Strayer looks on. (14) Navot seated next to the mayor of Herzlia. In the background are several soybean plants in jars atop a bookshelf. (15) Mr. Navot with a group of young people, enjoying a soya meal. (16) Participants seated at a seminar in Israel from Ceylon, Ghana, and India, invited to a "soya dinner" at Mr. Navot's home. (17) Navot standing at a dinner party behind Mr. Itzhak Ben-Zvi, President of State. (18) Navot shaking hands with and talking to Supreme Court Justice, E. Sussman. (19) Navot shaking hands with and talking to Minister of Development, Mr. M. Ben-Tov. Between them is the Mayor of Tel Aviv, Mr. M. Namir. Address: Jerusalem, Israel.

542. Baker, E.J., Jr. 1961. Combine: Reflections. *Implement & Tractor (Kansas City, Missouri)* 76(4):35-36. Feb. 1. [1 ref]

• ***Summary:*** First the author reprints a prophetic editorial he wrote 36 years ago in the 20 Nov. 1924 issue of *Farm Implement News.* That prophetic editorial began: "Recent tests of a combined harvester in Illinois in harvesting soy beans may prove a milestone in the extension of the use of this great labor-saving machine from the comparatively dry grain growing sections of the west to the eastern part of the country more blessed with rainfall."

It was the soybean that turned out to be responsible for the introduction of the combine into the eastern United States.

He then reflects on the history of the combine and the developments that were necessary to make it a practical and widely used farm machine. In the USA during the early 1900s, combines were made and used only in California. No effort was made to sell them to the "humid east" because it was widely believed that no small grain containing more than 14% moisture could be combined and the grain stored without overheating and spoiling.

Meanwhile in Australia, starting as early as 1843, a large market had developed for a harvesting machine that stripped the kernels from the stem but did not cut the stems; it left the winnowing to a later operation. In 1884 Hugh Victor McCay of Sunshine, near Melbourne, perfected a stripper-harvester that cleaned the grain after stripping it. This as similar competitive harvesters which followed revolutionized grain harvesting "Down Under" and later, by exports, in Argentina.

These developments prompted North American makers of harvesting machines to follow suit. In 1901 Massey-

Harris (MH) of Toronto (Ontario, Canada) began production of a stripper for export; in 1904 the International Harvester Co. (IHC) of Chicago, Illinois, did the same. Amazingly, neither company sold these machines to their domestic markets. But they both began to think about making smaller versions of the huge California combines, which were harvester-threshers rather than strippers. Thus, in 1910 Massey-Harris introduced a 10-foot reaper-thresher which had a cutterbar; it would be sold to the export markets of Australia and Argentina; in 1914 International Harvester did the same. Not long after, a market for combines developed in "dry" Kansas. Holt machines got there first, with IHC not far behind. At that time, MH had no sales organization in the USA.

The some time in 1923 or early 1924 *Farm Implement News* (FIN) received a letter from a subscriber in down-state Illinois. He was also an IHC dealer. He explained that one of his big customers [one of the Garwood Brothers of Stonington] was raising that newfangled crop, the soy bean, on a large scale, and he thought he could harvest them better if he had a combined harvester. He was willing to buy and use it at his own risk. IHC had discussed the matter at its headquarters and refused to ship a combine to Illinois under any circumstances, since it believed that combining any crop was impractical in any humid region such as Illinois. So, enquired the dealer, could FIN suggest any other source of a combine for his customer. Mr. Baker referred the subscriber to the Massey-Harris Co. of Canada as the only possible source of a moderate-sized machine, but knowing full well that MH did not sell in the USA. After some correspondence and reflection, Massey-Harris shipped the combine to Illinois, "and may even have sent an expert to see that it was set up and operated right."

The editorial in FIN described not only first successful combining of soy beans in Illinois–but also the first successful use of a combine on any crop east of Kansas.

Before 1925 all combines were pulled by horses or a tractor. In 1925 the first self-propelled combine was introduced in Australia. Named the Sunshine auto-header, it was developed by Headlie S. Taylor of H.V. McKay Pty., Ltd., of Sunshine, Australia. In 1939 Massey-Harris introduced the first self-propelled combine in North America. Its design had been perfected by the time World War II began and the demand for wheat skyrocketed. But steel was in very short supply during the war, and needed for crucial military operations. A man named Joe Tucker, a Michigan-born expert in heavy machinery with good ideas and irresistible drive, joined Massey-Harris at that fateful moment. He started the "Harvest Brigade" and persuaded the U.S. government to ship scarce domestic steel to a Canadian company so it could make combines to harvest American wheat. This, in turn, helped prevent delay of farmer acceptance of the new technology. Details of the history of the Harvest Brigade success are given.

Photos show: (1) A man with a big smile stepping onto a machine bearing a large white sign: "Massey-Harris, Self-Propelled, Harvest Brigade." (2) Front view of a Massey-Harris self-propelled combine working in a field.

543. Henderson, F.C. 1961. Department of Agriculture, Stock and Fisheries. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby).* p. 12-94. June. For the year 1959-60. See p. 32, 68, 70-72.

• ***Summary:*** In the section on "Division of Plant Industry," a subsection titled "Plant Introduction and Quarantine Station, Laloki" (near Port Moresby, Papua New Guinea) notes that this station is located 15 miles from Port Moresby in what might be called an ecological island in an irrigable river flat. Table 34 (p. 68) gives a classified list of plant introductions to Laloki during 1959-60, including 21 varieties of soybeans and 55 of peanuts.

A paragraph on "Soya beans *(Glycine max)*" (p. 70) states: "A wide range of soya bean varieties was introduced from the Commonwealth Scientific and Industrial Research Organization [CSIRO] of Australia and the United States Department of Agriculture [USDA]. After multiplication at Laloki, the varieties were distributed for field trial."

Note: This is the earliest document seen (March 2010) that clearly concerns soybeans in Papua New Guinea. This document contains the earliest clear date seen (March 2010) for soybeans in Papua New Guinea (Date)

The subsection titled "Plant pathology" states (p. 71) that four bottles of *Rhizobium* inoculum for *Glycine max* were distributed to soya bean growers in the territory. *Rhizobia* also produced successful nodulation on soya beans (p. 72).

544. Allen, G.H. 1961. Glycine: A pasture legume for Queensland. *Australia. Department of Agriculture and Stock, Division of Plant Industry, Leaflet* No. 596. p. 1-3. *

545. Bergerson, F.T. 1961. Oxygen tension, nodule respiration and nitrogen fixation. *Division of Plant Industry, CSIRO, Report* p. 41. For the years 1960-61. *

• ***Summary:*** The respiration of nodules on soybeans increased with increasing oxygen tension up to 0.9 atmospheres, but oxygen tensions above 0.5 atmospheres decreased the nitrogen fixation of detached nodules. It was hypothesized that at oxygen tensions of up to 0.5 atmospheres the stimulation of the activity of the soybeans provided an increased substrate supply for the bacteroids, but above this, the oxygen interfered with the nitrogen available for reduction by the bacteroids.

546. *Queensland Department of Agriculture and Stock, Annual Report (Brisbane).* 1961. [Field crop varietal and

cultural trials]. p. 9-10, 17-19. For the years 1960-61. [Eng]*

• ***Summary:*** In a soybean variety trial at Millaroo, CP3 15944 gave the best yields. Because of the influence of daylength on growth, November was the best month for planting soybeans.

547. Byth, D.E.; Waite, R.B. 1962. Soyabeans for sub-tropical Queensland. *Australian J. of Experimental Agriculture and Animal Husbandry* 2(5):110-16. May. [10 ref]

• ***Summary:*** The work described in this paper is aimed at selecting and developing soybean varieties for the Darling Downs and Brigalow regions of Queensland. These typically sub-tropical areas have an annual rainfall of 25 to 30 inches. Address: Cooper Lab., CSIRO, Lawes, QLD; CSIRO, Div. of Tropical Pastures, The Cunningham Lab., Mill Rd., St. Lucia, QLD, Australia.

548. Bergersen, F.J. 1962. Oxygenation of leghæmoglobin in soybean root-nodules in relation to the external oxygen tension. *Nature (London)* 194(4833):1059-61. June 16. [13 ref]

• ***Summary:*** "Leghæmoglobin, the characteristic red pigment of legume root nodules, seems to be involved in some component reaction of the fixation of atmospheric nitrogen which these organs accomplish." This experiment indicates that there is an oxygen barrier in the nodules which does not permit the passage of oxygen into envelopes containing bacteroids until a certain oxygen tension has been exceeded. Address: Div. of Plant Industry, Commonwealth Scientific and Industrial REsearch Organization (CSIRO), Canberra [Australia].

549. Taylor, Clifford C.; Singh, Bhagwant. 1962. The competitive position of Maryland soybeans. *Maryland Agric. Exp. Station, Bulletin* No. 473. 73 p. June. [14 ref]

• ***Summary:*** Contents: Summary. 1. Competition in price: Production expansion at lower prices, substitution and prices. 2. Competitive position in total consumption: Consumption of soybean meal. 3. Competitive position of oil in end products: Margarine, shortening, drying oil products, soap. 4. Competitive position of meal in feeding. 5. Competitive position in export markets: Potentialities of Africa as a competitor of United States soybean oil in Europe, competitive position of United States soybean oil in Asia, competitive position of United States soybean oil in Latin America, competitive position of United States soybean oil in Oceania, recapitulation. Appendix. Contains 39 tables and 6 figures.

"The soybean market has become of prime importance to growers on the Eastern Shore of Maryland. Here, as in nearby areas of Delaware and Virginia, soybean production has multiplied very rapidly within recent years." Address: Dep. of Agricultural Economics.

550. Wong, E.; Flux, D.S. 1962. The oestrogenic activity of red clover isoflavones and some of their degradation products. *J. of Endocrinology (London)* 24(3):341-48. June. [19 ref]

• ***Summary:*** The oestrogenic activities of the isoflavones biochanin A, genistein, formononetin and daidzein (all present in red clover and subterranean clover *[Trifolium subterraneum]*) were measured at 3 dose levels using the mouse uterine weight assay. The relative activities found were: genistein 1.5, biochanin A 1.0, and daidzein 0.4. Formononetin had little or no oestrogenic activity. Thus daidzein is only one-fourth as active as genistein, and genistein is only 1/100,000th as active as the synthetic estrogen, diethylstilbestrol (DES).

The authors found that mice consuming 5.8 mg genistein in a 15 gm diet over a 6 day period showed a twofold increase in uterine weight.

Rackis (1974, p. 170A) notes: "Assuming a genistin content of 0.15% in soybean meal, Wong and Flux would have had at least 41% soybean meal in their diet for the mice to receive 9.3 mg genistin (equivalent to 5.8 mg genistein) and for uterine weight to increase twofold." Address: Plant Chemistry Div., Dep. of Scientific and Individual Research, Palmerston North, and Massey Agricultural College, Palmerston North, New Zealand.

551. Bergersen, F.J. 1962. The effects of partial pressure of oxygen upon respiration and nitrogen fixation by soybean root nodules. *J. of General Microbiology (England)* 29(1):113-25. Sept. [16 ref]

• ***Summary:*** "Increased oxygen tension... caused increased respiration by excised soybean nodules of all ages. The increase took place in two steps..." It is suggested that the first step is due to oxygen consumption by plant tissue and the 2nd step to oxygen consumption by the bacteroids.

The respiration of bacteroids increased with increased oxygen tension. Increased oxygen tension increased nitrogen fixation by excised modules. Address: Div. of Plant Industry, CSIRO [Commonwealth Scientific and Industrial Research Organization], Canberra, Australia.

552. Thrower, Stella L. 1962. Translocation of labelled assimilates in the soybean. II. The pattern of translocation in intact and defoliated plants. *Australian J. of Biological Sciences* 15(4):629-49. Nov. With 2 plates. [14 ref]

• ***Summary:*** Studies of carbon-14 labelled assimilate in the soybean show that the expanding leaf is the major apical sink. The expanding leaf imports assimilate from levels below, this import rising to a maximum and then falling to almost zero when the leaf is half expanded. At this stage, the leaf has begun exporting assimilates to younger leaves.

Export, both to younger leaves and down the stem to the root, increases until the leaf is fully expanded. The expanded leaves may also import assimilate to a very slight degree. Photos show: Nine expanding leaves. Radioautographs of different parts inside the soybean plant. Address: Botany Dep., Univ. of Melbourne.

553. Hermann, F.J. 1962. A revision of the genus *Glycine* and its immediate allies. *USDA Technical Bulletin* No. 1268. 82 p. Dec. Illust. [26 ref]

• ***Summary:*** Contents: Introduction. Taxonomic history of the genus Glycine. Taxonomy: Key to genera related to Glycine, systematic list of Glycine and its immediate allies. Glycine (Subgenus Leptocyamus, subgenus Glycine, subgenus Soja), species excluded from Glycine, Paraglycine, Pseudoglycine, Teyleria. Index.

"A tabulation of the species described as *Glycine* from Index Kewensis, for example, results is a total of 286 and the addition of published subspecies and varieties brings the number to 323... Linnaeus proposed eight species under the name *Glycine* in 1753 in Species Plantarum (p. 753-54). The cultivated soybean, *Glycine max*, appeared in the same work as *Phaseolus max* (p. 725) and also under the name *Dolichos soja* (p. 727)... In 1825 De Candolle summed up the genus as embracing 21 species, of which only 2 species *(G. clandestina* Wendl. and *G. javanica* L.) can be admitted to the genus as here defined. It was not until 1864 that the first major addition to the genus was made. This was by Bentham, who treated the genus in Australia as comprising six species, all of them still valid although two of his names *(Glycine sericea* and *G. tomentosa)* must be dropped as being later homonyms... Bentham's *Glycine falcata* of 1864 was the last of the true *Glycine* species to be described."

This article contains many superb illustrations by Regina O. Hughes. In the subgenus Leptocyamus (wild perennial Glycine species), the author includes Glycine clandestina Wendl. (Australia, Formosa, Micronesia), G. clandestina var. sericea Benth (Australia), G. falcata Benth. (Australia), G. Latrobeana (Meissn.) Benth. (Australia), G. canescens F.J. Herm. (Australia), G. tabacina (Labill.) Benth. (Australia, southern China, South Pacific Islands), G. tomentella Hayata (Australia, south China, Philippines, Formosa).

Note: This is the earliest document seen (July 2007) concerning soybeans (but only wild perennial relatives of soybeans) in Micronesia; cultivated soybeans have not yet been reported. Yet it is not clear where in Micronesia these soybeans were growing, and if they were growing in the Federated States of Micronesia. Address: Senior botanist, Crops Research Div., Agricultural Research Service; USDA.

554. Beadle, N.C.W.; Evans, O.D.; Carolin, R.C. 1962. Handbook of the vascular plants of the Sydney district and Blue Mountains. Armidale, Australia: Published by the first author. 597 p. Illust. Index. 21 cm. *

555. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1962. Appendix IV–Results of rice and soya bean experiments, 1962. For the year 1962. See p. 10-11.

• ***Summary:*** Table IV, titled "Dry season:–Soya bean experiments" (p. 11) gives the variety name, yield (in lb/acre), and number of days to maturation for the following 12 soybean varieties: Hernon 237, HLS 147, HLS 154, HLS 167, HLS 219, HLS 239, HLS 241, HLS 263, HLS 273, Light speckled, Mis 28 E.B., and R184.

The mean yield of the experiment was 1,505 lb/acre. The variety HLS239 had the highest yield (1,744 lb/acre) and the shortest maturation period (88 days). None of the varieties lodged badly.

"A further bulk planting of soya was made at a rate of 63 lbs of seed to the acre drilled in 14-inch rows. The crop closed its canopy quickly and no weeding was required. As was to be expected under these conditions the plants grew tall and lodged. However, no great difficulty was experienced in combining it and test areas yielded 2,810 lbs to the acre."

Note: The many successful Hernon varieties were first developed in [Salisbury] Rhodesia by H.C. Arnold in about 1940-41, then shared with Nyasaland (1943), Uganda (1946), and Tanganyika (1956). The HLS varieties were developed in Nyasaland as a cross between "Hernon" and "Light Speckled." Yet this is the earliest document seen (May 2007) that mentions HLS soybean varieties. According to Holsheimer (1966): "In 1961, small quantities of seeds of 12 varieties were imported from Tanganyika, as a rotation crop with rice..."

556. Hockings, E.T.; Veitch, R. ed. and comp. 1962. The Queensland agricultural and pastoral handbook. Vol. I. Farm crops and pastures. Brisbane: Queensland Dep. Agric. Stock. 590 p. Illust. 25 x 16 cm. *

557. **Product Name:** [Seitan].
Foreign Name: Seitan.
Manufacturer's Name: Marushima Shoyu K.K.
Manufacturer's Address: Kamigata-dori Ko 881, Uchiumi-cho, Shodo-gun, Kagawa-ken, Japan.
Date of Introduction: 1962. January.
Wt/Vol., Packaging, Price: 3.5 oz jar.
How Stored: Shelf stable.
New Product–Documentation: Note: This is the world's earliest known commercial seitan product (Feb. 2005). It was first imported to the USA by Erewhon Trading Co. in 1969.

Talk with Aveline Kushi. 1992. April 9. The first seitan imported to America was made by Marushima Shoyu Co. on

Shodoshima in Japan. George Ohsawa went to visit the company, talked with Mr. Mokutani (who is still the chairman, and a close friend of the Kushis, and a great admirer of Ohsawa), and showed him how to make it. Marushima began to make seitan commercially in the late 1960s. It was imported to America by Muso Shokuhin at about the same time the first miso and shoyu were imported. She thinks it came in small jars, and was so salty that she used it as a seasoning in place of soy sauce in stews (such as soybean stews) or cooked it with vegetables; this cooking made it softer. This seitan probably started to be imported to America in about 1969.

Letter (fax) from Yuko Okada of Muso Co. Ltd., Japan. 1992. July 2. "I remember the term 'seitan' since I was a kid; it was probably coined by George Ohsawa. *Sei* means 'is' and *tan* is the first character in the Japanese term *tanpaku,* which means 'protein.' So *seitan* means something like 'right protein substitute.' Marushima Shoyu Co. developed seitan commercially in Japan and Muso has carried their seitan since Feb. 1966 when we started. We shipped seitan to Erewhon on a regular basis from 1968. [Note: Kotzsch. 1984, Dec. *East West Journal* p. 14-21 states that Muso began to export foods in 1969.] We also exported it to Chico-San [in the USA]. In Europe, we exported seitan to Paris, France." This seitan went to Institut Tenryu, which had a little macrobiotic food shop in Paris run by Madame Francoise Riviere. The first seitan Muso exported to Australia went to Spiral Foods.

Muso Shokuhin. Pure Heart–Muso general catalogue. 1990 July. p. 41. A color photo shows a 180-gm jar of Seitan. The product name is written in English (i.e., in roman letters). Under that, it is written smaller in katakana. Above the company name and address is written: "Sakurazawa Nyoichi shido" which means, "Made under the guidance of George Ohsawa."

Talk with Mr. Kiyoshi Mokutani, president of Marushima Shoyu K.K. in Japan. 1992. July 12. "The invention and development of seitan in Japan." He invented seitan in 1961-62 and took a sample to George Ohsawa, who coined the term "seitan" upon seeing it. Commercial production began in 1962. For details, see interview.

558. *Agricultural Gazette of New South Wales.* 1963. Soybeans: An ancient crop finding new favour in modern agriculture. 74(4):209-12. April.

• ***Summary:*** Contents: Introduction. In New South Wales. Soil and climatic requirements. Soil preparation. Time and methods of sowing. Fertilizers. Inoculation of seed. Varieties (Nanda is best). After cultivation. Rotation. Harvesting. Storage. Yields. Insect pests. Diseases. Uses of soybeans.

New South Wales has more than 45 years of experience with soybean cultivation. More than 500 varieties have been imported. Field trials have been conducted at Hawkesbury Agricultural College and experiment farms. Yet yields have been low, about 7 bushels per acre over a recent ten year period. "In the 1946-47 season, an attempt at large scale production was sponsored by the Commonwealth Government and a considerable quantity of seed of popular U.S.A. varieties was introduced. Some 2,000 acres were sown, but again the yield of beans on the area harvested was only approximately 6 bushels per acre... The area sown to soybeans in this State in the last ten years has been negligible."

Yet new interest in the crop has arisen because of the need for high quality protein meal [for livestock and poultry feed] and the superior qualities of the oil in making special paints.

Note: An article titled "Legume inoculant quality," published in the May 1964 issue (p. 1042) of this journal, shows that lucerne, clover, and vetches are the three main legumes now grown in New South Wales.

559. Meals for Millions. 1963. Friendship food for a hungry world. Distribution of relief shipments, September 1946–May 15, 1963. 215 West 7th Street, Los Angeles 14, California. 4 p. Undated. [2 ref]

• ***Summary:*** Total distribution of MPF (Multi-Purpose Food) up to 15 May 1963 was 12,830,416 pounds, comprising 102.6 million meals. Countries receiving over 20,000 pounds, in descending order of amount received, were: India (1,979,748 lb), Korea (1,356,110), Japan (541,102), Hong Kong (394,259), China (358,957, stopped in 1951), Brazil (312,244), Germany (206,185), United States (183,366), Philippines (146,943), Haiti (139,823), France (126,022), Pakistan (101,041), Congo (86,101), Austria (82,159), Tanganyika (77,997) Mexico (65,722) Burma (63,554), Taiwan (58,639), Lebanon (56,910), Canada (51,836), Ceylon (38,428), Israel (38,280), Jamaica (38,171), Greece (38,133), Vietnam (37,524), Italy (36,768), Indonesia (35,873), Jordan (33,375), Hungary (33,165), New Guinea (31,535), Gabon (27,704), Liberia (27,187), Okinawa (23,640), Malaya (23,454), Morocco (22,736), Chile (22,721), Iran (21,482), Peru (21,374), Honduras (21,168), Bolivia (20,860), Nepal (20,626), Borneo (20,053).

The following countries (listed alphabetically) were early recipients of soy-based Multi-Purpose Food from Meals for Millions, and were late in introducing soybeans to the country: Bahamas (received 6 shipments totaling 2,079 lb between 1 July 1960 and 31 Dec. 1962). Basutoland [Lesotho] (received 2 shipments totaling 1,539 lb between 1 July 1960 and 31 Dec. 1962). Bolivia (received 2 shipments totaling 1,634 lb between Sept. 1946 and 30 June 1960). British Honduras (received 5 shipments totaling 11,319 lb between Sept. 1946 and 30 June 1960; renamed Belize in about 1975). Cape Verde Islands (received 1 shipment of 2,007 lb between Sept. 1946 and 30 June 1960; independent since 1975). Caroline Islands (received 2 shipments totaling 2,008 lb between Sept. 1946 and 30 June 1960; renamed Federated States of Micronesia in 1986). Central African Republic (received 1 shipment of 2,025 lb between 1 July 1960 and 31 Dec. 1962). Eritrea (received 1 shipment totaling 2,025 lb between Sept. 1946 and 30 June 1969). Fiji Islands (received 2 shipments totaling 2,052 lb between Sept. 1946 and 30 June 1969). Finland (received 1 shipment of 2,040 lb between Sept. 1946 and 30 June 1960). Gabon (received 3 shipments totaling 17,660 lb between Sept. 1946 and 30 June 1960). Guam (received 3 shipments totaling 4,995 lb between 1 July 1960 and 31 Dec. 1962). Guadalcanal ([later part of the Solomon Islands] received 1 shipment of 513 lb between Sept. 1946 and 30 June 1960). Iraq (received 3 shipments totaling 8,122 lb between Sept. 1946 and 30 June 1960). Jordan (received 9 shipments totaling 28,839 lb between Sept. 1946 and 30 June 1960). Liberia (received 10 shipments totaling 21,949 lb between Sept. 1946 and 30 June 1960). Luxemburg [Luxembourg] (received 1 shipment of 5,130 lb between Sept. 1946 and 30 June 1960). Marshall Islands (received 1 shipment of 739 lb between Sept. 1946 and 30 June 1960). Mozambique (received 3 shipments totaling 7,641 lb between Sept. 1946 and 30 June 1960). New Hebrides [later Vanuatu] (received 1 shipment of 513 lb between Sept. 1946 and 30 June 1960). Oman (received 4 shipments totaling 10,659 lb between Sept. 1946 and 30 June 1960). Panama (received 1 shipment of 96 lb between Sept. 1946 and 30 June 1960). Samoa (American) (received 6 shipments totaling 6,480 lb between Sept. 1946 and 30 June 1960). Somali (received 1 shipment of 270 lb between 1 July 1960 and 31 Dec. 1962). Swaziland (received 1 shipment of 621 lb between 1 July 1960 and 31 Dec. 1962). Tonga Islands [Kingdom of Tonga, independent since 1970] (received 5 shipments totaling 6,723 lb between 1 July 1960 and 31 Dec. 1962). Virgin Islands [USA] (received 2 shipments totaling 2,113 lb between Sept. 1946 and 30 June 1960). Western Samoa [independent since 1962] (received 1 shipment of 1,026 lb between 1 Jan. 1963 and 15 May 1963).

Other countries which received MFM shipments by 15 May 1963 are: Afghanistan, Algeria, Angola, Argentina, Basseterre [Probably refers to the island, Basse-Terre (or Guadeloupe proper) which is the western half of Guadeloupe, separated from the other half, Grand-Terre, by a narrow channel. As of 1994 Guadeloupe is a French Overseas Department. Probably not the seaport on St. Christopher Island, capital of St. Christopher-Nevis–since that is not a country], Belgium, Cambodia, Republic of Cameroun [Cameroon], Canal Zone, Colombia, Costa Rica, Cuba, Czechoslovakia, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, England, Eritrea, Ethiopia, French West Indies, Gambia, Ghana, Goa [former Portuguese possession; annexed by India in 1962; became a state of India in 1987], Grenada, Guatemala, Haute Volta [Upper Volta, later Burkina Faso], Iraq, Kenya, Laos, Libya, Macao, Madeira Islands [autonomous region of Portugal in east Atlantic Ocean, 600 miles due west of Casablanca, off the coast of Morocco], Mauritius Islands, Montserrat [island in the West Indies], Netherlands, Nicaragua, Nigeria, Northern Rhodesia [later Zambia], Nyasaland [later Malawi], Oman, Paraguay, Persian Gulf, Poland, Puerto Rico, Ruanda Urundi, Rumania [Romania], Ryukyu Islands, American Samoa, Santa Lucia [probably Saint Lucia island in the Caribbean], Sicily, Sierra Leone, South Africa, Southern Rhodesia [later Zimbabwe], Spain, Surinam [Suriname], Switzerland, Thailand, Trieste [Italy], Tunisia, Turkey, Uganda, Uruguay, Venezuela, Yugoslavia.

Note: This is the earliest document seen (March 2010) concerning soybean products (soy flour in MPF) in British Honduras [Belize], Cape Verde, Caroline Islands, Eritrea, Iraq, Lesotho, Liberia, Luxembourg, Marshall Islands, New Hebrides [Vanuatu], Oman, Samoa (American), Tonga, or Western Samoa. Soybeans as such have not yet been reported in these countries.

This document contains the earliest date seen (Feb. 2009) for soybean products (soy flour in MPF) in Bolivia (June 1960), British Honduras (June 1960), Cape Verde (June 1960), Central African Republic (Dec. 1962), Eritrea (June 1960), Iraq (June 1960), Lesotho (Dec. 1962), Liberia (June 1960), Luxembourg (June 1960), Marshall Islands (June 1960), New Hebrides (June 1960; Vanuatu), Oman (June 1960), Samoa (American) (June 1960), Tonga (Dec. 1962), or Western Samoa (May 1963). Soybeans as such had not yet been reported by that date in these various countries. Address: Los Angeles, California.

560. Bergersen, F.J. 1963. The relationship between hydrogen evolution, hydrogen exchange, nitrogen fixation, and applied oxygen tension in soybean root nodules. *Australian J. of Biological Sciences* 16(3):669-80. Aug. [12 ref]

• ***Summary:*** Detached soybean root nodules were used in this study, using various external oxygen tensions. Address: Div. of Plant Industry, CSIRO, Canberra, Australia.

561. Bergersen, F.J. 1963. Iron in the developing soybean nodule: Short communications. *Australian J. of Biological Sciences* 16(4):916-19. Nov. [14 ref]

• ***Summary:*** "The metabolism of iron in legume root nodules is of particular interest because of the presence of relatively large amounts of the myoglobin-like pigment, leghaemoglobin. This pigment appears when the nodules are about 2 weeks old and its appearance coincides with the onset of nitrogen fixation. There are also quite large amounts of bacterial cytochromes present...

"In the mammalian liver, iron from degraded haemoglobin is conserved in the iron-containing protein, ferritin, from which it can be released for incorporation into newly synthesized haem, or other compounds.

A graph (p. 917) shows the distribution of iron among nodule fractions of various ages from 2 to 14 days. Iron content is measured in micrograms per gram of fresh weight of nodules. Total iron increases from 50 at 2 days to over 70 at 14 days. Non-haemin iron (ferritin-like iron) decreases from 40 at 2 days to about 12 at 14 days. Iron soluble in cold trichloracetic acid (TCA) increases from about 5 at 2 days to about 28 at 14 days. And haemin iron increases from zero at 2 days to about 23 at 14 days. Address: Div. of Plant Industry, CSIRO, Canberra, Australia.

562. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby).* 1963. Division of Plant Industry. p. 31-94. Nov. For the year 1960-61. See p. 62-63, 71, 73-75.

• ***Summary:*** In the section titled "Agricultural Experiment Station, Epo" is a subsection titled "Soy bean" *(Glycine max)* (p. 62-63) which notes that 13 varieties were planted in an unreplicated trial in early January, at the beginning of the wet season. All varieties were seriously damaged by insects. A table shows the name, yield, and seed color of each variety. The highest yielding varieties (in lb/acre in the pods) were: Batavian Yellow (3,091), Mamloxi (3,020), Avoyelles (2,224), C.N. 5 (1,852), Mamloxi 57/5 (1,770), and Glycine 317 (1,624).

The section titled "Plant Introduction and Quarantine Station, Laloki" (near Port Moresby, Papua New Guinea) states that 14 soybean varieties were introduced in 1960-61 (p. 71). The subsection titled "Soy bean" *(Glycine max)* (p. 73) states that attempts were made to introduce varieties that might be adaptable to the Markham Valley and other lowland areas. The introductions from the Philippines were chosen mainly for non-sensitivity to photoperiod. Six bottles of soybean Rhizobium inoculum were distributed to growers throughout the Territory (p. 74). Rhizobium inoculations and inoculation studies were conducted (p. 75).

563. Special Advisory Authority on Emergency Import Restrictions. 1963. Report under part V of the Tariff Board Act, 1921-1962, on safflower seed and soya bean oils, 17th December 1963. Canberra, Australia. 6 p. Tables. 34 cm. * Address: Canberra Australia.

564. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1963. Section VIII–Research and special projects. For the year 1963. See p. 7-8.

• ***Summary:*** Under "Rice investigation" we read (p. 8): "58. Simple variety and spacing trials were conducted with soya beans. Encouraging results were obtained and useful knowledge gained under Solomon Islands conditions. Mean yields ranging from 1,071 to 2,092 lbs per acre were achieved under experimental conditions which compare favourable with yields in other tropical countries. Private enterprise has shown interest in the progress of the trials and one potential investor is arranging for further experiments and trials to be undertaken. Soya beans could become an important economic crop."

Note: The rice research was conducted at Ilu, Guadalcanal. The context seems to indicate that the soya bean trials were conducted at the same location.

565. Rose, Ian F. 1963. Faith, love and seaweed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc. 221 p. Illust. Index. 24 cm. [30+ ref]

• ***Summary:*** This book is written by the father of Murray Rose, now age 23, one of the world's greatest swimmers, and the winner of many Olympic gold medals. It is the true story of how Murray was raised on a vegetarian diet, with emphasis on raw foods, natural foods, natural living, and whole-food principles. By the age of 13, Murray's prowess was already making news. In 1956, at age 17, he became the youngest triple Olympic gold medalist in the entire history of sport. In Rome, 4 years later, he made Olympic history again by winning the 400 meter freestyle and thus becoming the first person to win a distance swimming event in two successive Olympics. In college he swam for the University of Southern California (USC).

Mr. Rose advises 10 important dietary habits: 1. Wait until you are hungry before eating. 2. Eat simply, paying attention to food combinations. 3. Eat moderately. 4. Chew food thoroughly. 5. Eat raw foods whenever possible. 6. Never eat when overtired, worried, or emotionally upset. 7. Avoid sauces and condiments. 8. Don't drink with meals. 9. Avoid drinking alcohol and smoking tobacco. 10. Avoid eating meat.

Rose uses 3 main sources of protein: (1) Seeds (especially sesame and sunflower seeds); (2) nuts, and legumes (especially soybeans); cheese and fertile eggs (but not cow's milk). Rose has "four magic foods that guard you against vitamin and mineral deficiencies": seaweed, rose hips (for vitamin C), brewer's yeast (for B vitamins), and any good source of vitamin E (such as wheat germ and wheat germ oil).

In chapter 8, "Our protein pyramid: Seeds, nuts, and dairy products," the section titled "Soybeans give us better protein than steak" (p. 115-17) begins: "The other legume that deserves a permanent place in our store cupboard is the soybean. This is a better source of protein than meat or eggs as is demonstrated by the following table. In every case, soybeans come out ahead." Three tables compare meat, eggs, and soybeans for their content of essential amino acids, minerals, and vitamins. "It is not hard to conclude that soybeans could well be part of everyone's diet, whether or not we include meat. The use of soybean flour is a good idea, too. Merely by substituting as little as five percent in any recipe containing wheat flour, you will be greatly increasing the protein value of the food."

In the section on dairy products, there are subsections titled "The fallacy of cow's milk as a human food" (p. 117) and "The alternatives to cow's milk" (p. 121). "As an alternative to cow's milk we introduced soy milk into Murray's diet with success. Ready prepared soy milk is obtainable today in many health stores but it can be made at home with a blender. One way is as follows:..." Also discusses tahini milk and almond milk.

Page 186 states that cow's milk, if consumed at all, should be consumed raw. It is wise to specify "certified raw milk." "If only pasteurized milk is available it may be best to substitute soy milk or to use a home-made nut milk... Soybeans are one of the few legumes which contain complete protein. They may be purchased ready-cooked or dry."

The section titled "The best kind of fat–and how to select it" suggests that unsaturated fatty acids are good for health and animal fats are best omitted from the diet. "Their place should be taken by soy oil, sunflower oil, sesame oil, safflower oil, and other vegetable oils." The ratio of polyunsaturates to saturates is given for each. "Soy oil, extracted from the soybean,... contains a high percentage of polyunsaturated fatty acids." Address: Sydney, Australia.

566. **Product Name:** Soy Chips or Grits.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: 729-1738.
Date of Introduction: 1963?
Ingredients: Soybeans.
New Product–Documentation: Talk with Paul Smith of Soy Products of Australia Pty. Ltd. 1995. This product was introduced after 1963, when the full mill operation came on stream.

567. Langer, R.H.M.; Bussell, W.T. 1964. The effect of flower induction on the rate of leaf initiation. *Annals of Botany* 28(109):163-67. Jan. [13 ref]
• ***Summary:*** Vegetative plants of four short-day and five long-day species were exposed to inductive or non-inductive daylengths continuously, or to inductive conditions just long enough to induce flowering. Among the short-day plants examined were the Biloxi soybean variety. The first detectable indication of floral induction is usually an elongation of the apical meristem. This is quickly followed by precocious development of buds in the axils of the leaf primordia.

It is concluded that floral induction and stimulation of leaf initiation are likely to be universally associated whether species are photoperiodically sensitive or not. Address: Lincoln College, Canterbury, New Zealand.

568. Harty, R.L. 1964. Effect of previous cropping with soybeans on the nodulation of soybeans on the Darling Downs, Queensland. *Queensland J. of Agricultural Science* 21(1):145-46. March. [1 ref]
• ***Summary:*** Persistent reports have noted the difficulty that soybeans have nodulating when grown on the black soils of Darling Downs. When grown in first-year soil (i.e. soil in which soybeans have not been grown previously), uninoculated seed produced 15 plants but no nodules, whereas inoculated seed produced 11 plants containing 15 nodules. On second-year soil, uninoculated seed produced 19 plants containing 133 nodules, whereas inoculated seed produced 13 plants containing 144 nodules. Thus the inoculum strain used appeared to be effective, but not until the second year. Address: Queensland Dep. of Primary Industries.

569. Pritchard, A.J.; Wutoh, J.G. 1964. Chromosome numbers in the genus *Glycine* L. *Nature (London)* 202(4929):322. April 18. [5 ref]
• ***Summary:*** The authors are conducting a breeding programme with the introduced forage legume *Glycine Javanica* (L.), a species with great potential over large areas of Queensland.

Table 1 lists the following species in the genus *Glycine* with their diploid chromosome number and seed source: *G. javanica* (22 or 44; India, Brazil, Northern Rhodesia, Tanganyika, Kenya), *G. clandestina* (40; Queensland), *G. falcata* (40; Queensland), *G. tabacina* (80; New South Wales), *G. tomentella* (40; New South Wales), *G. max* (40; Nigeria). Address: 1. CSIRO, Div. of Tropical Pastures, Cunningham Lab., St. Lucia, Brisbane, Australia; 2. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Brisbane.

570. *Quincy Herald-Whig (Illinois).* 1964. Irving Rosen, Soybean Products founder, dies. April 20. p. 8B.
• ***Summary:*** "Irving J. Rosen, 65, of Chicago, founder of Quincy Soybean Products company and former widely known Quincy businessman diet Saturday night [April 18] at 11 in St. Mary's hospital [at the Mayo Clinic] in Rochester, Minnesota, where he had been taking treatments."

Mr. Rosen was born on 8 July 1898 in Chicago, Illinois. He started in the family grain business in Madison, Wisconsin at an early age. In 1939, with his young family, he relocated to Quincy, Illinois where he founded the Quincy Soybean Products Co. and became its president.

"The company prospered and grew under his management and he was largely instrumental in expanding the soybean industry in eastern Missouri and western Illinois through the establishment of country elevator operations and education of farmers in growing and marketing soybeans. The soybean business was sold in 1961 to a subsidiary of the Moorman Manufacturing company and Mr. Rosen located in Chicago.

"Mr. Rosen was widely recognized for his active participation and interest in business, civic and philanthropic affairs. He was a member of the Chicago board of trade, a director of the National Soybean Processors association, a member of the board of the Quincy Industrial association and a member of the Quincy Rotary club. He was also a member of the American Legion. He was a 32nd degree mason and was a member of Ainad Shrine temple. He was a member of the board of directors of B'nai Sholom temple and a past president of the local B'nai Brith lodge. He was a past chairman of the United Jewish Appeal.

"Surviving are his widow; two daughters, Mrs. Harry (Naomi) Jackson of Quincy and Mrs. Ernest (Harriet) Karmin of Chicago; two sons, Norman Rosen of Beverly Hills, California, and Arnold Rosen of Melbourne, Florida; three sisters, Mrs. Helen Mittlepunkt and Mrs. Dorothy Weinburg of Chicago [Illinois], and Mrs. Emily Landy of Long Beach, California; two brothers, Haskell and Stanley Rosen of Chicago, and nine grandchildren."

A portrait photo shows Irving J. Rosen.

571. Holdsworth, M. 1964. The leaf movements of soybean, a short-day plant. *J. of Experimental Botany* 15(44):391-98. May. [10 ref]

• ***Summary:*** Buenning's theory, first proposed in 1944, was revised in 1954 (with soybeans) and 1961. In its final form (1961), it explains photoperiodic responses as being interactions of the day length with an endogenous rhythm, and "was proposed as a general theory of photoperiodism; but, in fact, is applied easily only to short day plants."

These experiments were begun in Ghana and completed in New Zealand. The soybean variety, Fort, was used in Ghana; the variety Biloxi, obtained from the Beltsville Experiment Station in Maryland (USA), was used in New Zealand. "Biloxi soybean is a well-known short-day plant and its leaflets show pronounced movement between day and night. However, measurements of the angle between the day and night positions of the leaves did not reveal any difference in long and short days." Address: Botany Dep., Univ. of Otago, New Zealand.

572. Harty, R.L.; Bygott, R.B. 1964. Studies on the growth of soybeans on the Darling Downs, Queensland. *Queensland J. of Agricultural Science* 21(2):205-12. June. [3 ref]

• ***Summary:*** Soybeans have been in limited commercial production in Queensland since 1953-54, mainly in the South Burnett district. Soybean investigations at Hermitage Research Station date from 1959; the station is situated in the Swan Creek Valley of eastern Darling Downs at an altitude of 1,575 ft. Mean annual rainfall for the 18 years to 1962 was 28.46 inches; approximately 70% of the rain fell during the summer.

Soybean seed yields of up to 1,655 lb (27.58 bushels) per acre have been produced during the past 3 years at the Hermitage Station on chernozem type soils. The highest yielding varieties were Nanda, ECR 973 Congo, and selections from Delsta and Mammoth Biloxi hybrids. Address: Queensland Dep. of Primary Industries.

573. Kriedeman, P.E.; Neales, T.F.; Ashton, D.H. 1964. Photosynthesis in relation to leaf orientation and light interception. *Australian J. of Biological Sciences* 17(3):591-600. [9 ref]*

• ***Summary:*** The photosynthesis of attached leaves of soybeans and 3 other plants was measured in relation to light intensity and, at moderate light intensities, to angle of incidence of the light at the leaf surface. At a light intensity of 20 x 10^4 erg/sec/cm^2 the photosynthetic rate of sugar-beets was considerably higher than those of soybeans or wheat, but on a chlorophyll basis, that of soybeans was the highest of the 3. At half the light intensity given above, the relative light intensity at the leaf surface and the relative net photosynthesis were both proportional to the cosine of the angle of incidence. Two reasons for the latter proportionality are given. Address: Univ. of Melbourne.

574. Thrower, S.L. 1964. Translocation of labelled assimilates in the soybean. III. Translocation and other factors affecting leaf growth. *Australian J. of Biological Sciences* 17(2):412-26. [30 ref]*
Address: Univ. Melbourne.

575. Beadle, N.C.W. 1965. Nitrogen economy in arid and semi-arid plant communities. III. The symbiotic nitrogen-fixing organisms. *Proceedings of the Linnean Society of New South Wales* 89(Part 2, No. 405):273-86. Jan. [11 ref]

• ***Summary:*** Page 278 reports nodulation in *Glycine sericea* (F. Muell) Benth. (=*G canescens* Hermann), and *Glycine tomentella* Hayata (=*G tomentella* Benth.) in Australia. Address: Dep. of Botany, Univ. of New England, Armidale, NSW, Australia.

576. Australia Tariff Board. 1965. Tariff revision; report on safflower seed and soya beans, safflower oil and soya bean oil, 26th February, 1965. Canberra, Australia: Canberra Government Pr. 13 p. 34 cm. *
Address: Canberra Australia.

577. Bergersen, F.J. 1965. Ammonia–An early stable product of nitrogen fixation by soybean root nodules. *Australian J. of Biological Sciences* 18(1):1-9. Feb. [11 ref]

• ***Summary:*** Ammonia has been considered the most likely form in which fixed nitrogen enters assimilatory pathways in both free-living and symbiotic agents of nitrogen fixation. Experiments with detached soybean root nodules exposed to atmospheres containing very high enrichments of radioactive nitrogen for short periods of time have shown that at about 1 minute from the beginning of fixation, more than 90% of the soluble fixed nitrogen could be accounted for as ammonia. "The proportion of the newly fixed nitrogen in this form then rapidly diminished as the ammonia was converted into amino and other compounds." Address: Div. of Plant Industry, CSIRO, Canberra, Australia.

578. Bascom, William R. 1965. Ponape: a Pacific economy in transition. *Anthropological Records (University of California Press)* 22:1-156. April. 15. See p. 87. [231* ref]
• ***Summary:*** The Preface states (p. iii): "This study was written in 1946 as volume 8 of the U.S. Commercial Company's *Economic Survey of Micronesia.*" See Bascom (1946) for details on the introduction of the soybean to Micronesia and Ponape. In this 1965 article, "soya beans" are mentioned on p. 87. Address: [Univ. of California].

579. Henderson, F.C. 1965. Division of Plant Industry. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby).* p. 48-163. April. For the years 1961-63. See p. 48, 108-09, 156, 163.
• ***Summary:*** In the section titled "Highlands Agricultural Experiment Station, Aiyura" is a subsection on a "Soya bean variety trial" (p. 108-09) which states: "Interest in this crop has stemmed primarily from its nutritional value, and chemical analyses have been associated with agronomic studies. A variety trial was planted in November 1961, to compare yields of 15 varieties and to study the effect of inoculation of the seed with *Rhizobium.*"

"In 1963, plots of most of these varieties were planted at Aiyura, Minj, Wabag and Laiagam, in order to compare their performance at different localities and altitudes." A table (p. 109) shows the results of the trial harvested in 1962. For each of the 15 varieties is given the name, place of origin, seed description, time to mature in months, and yield. Yields from inoculated plants was only about 2½% greater than from uninoculated plants The highest yielding varieties (in lb/acre) were: Tanganyika (2,643; from Tanganyika, large dull black seed). Coral Sea Mission (2,407; from Goroka in highlands of central Papua New Guinea, large dull black seed). Avoyelles (2,366; from Nigeria, black, yellow and brown seeds mixed). Hernon 49 (2,330; from Tanganyika, large yellow seed). Baptist Mission (2,175; from Baiyer River in highlands of central Papua New Guinea, large yellow seed). Blyvoor (2,014; from South Africa, large yellow seed). Batavian Yellow (1,990; from Tanganyika, shiny black seed). SHE 30 (1,900; from Congo, large yellow seeds). Glycine 317 (1,742; from Tanganyika, small yellow seed). Geduld (1,639; from South Africa, large yellow seed). CN 5 (1,582; from Tanganyika, small yellow seed). Ringgit (1,462; from Indonesia, small yellow seed). Two Mamloxi varieties from Nigeria gave very low yields.

In the section titled "Agricultural chemistry," a subsection on "Plant nutrition studies" (p. 155-56) contains a table showing that 2 samples soybean leaves were analyzed in 1961-62. A paragraph titled "Soya bean" (p. 163) states that 37 samples "were received from variety trials at the Highlands centers of Aiyura, Minj, Wabag and Laiagam." Those which have been analyzed show wide variations in oil and crude protein content between varieties and within the same variety grown at different locations. Samples including "soya bean, soya oil and soya bean cake from a small oil crushing installation established by a Mission in the Markham Valley" were also analyzed. Address: Director.

580. Bryan, W.W.; Sharpe, J.P. 1965. Soybeans as a cash crop on virgin land in the Wallum of south-eastern Queensland. *Australian J. of Experimental Agriculture and Animal Husbandry* 5(17):147-51. May. [6 ref]
• ***Summary:*** Soybean trials were conducted on virgin land each year from 1960 to 1963. The varieties came from Tanganyika, Nigeria, Sudan, and the USA. The soybeans were planted in October, November, and/or January. The highest yield from one variety (Avoyelles in 1962-63) was 1,338 lb/acre. The highest average yield of 4 or more varieties in one season was 1,038 lb. Address: Div. of Tropical Pastures, The Cunningham Lab., St. Lucia, Queensland, Australia.

581. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report (Honiara).* 1965. Policy. Research and special projects. 108 p. June. For the year 1964. See p. 2, 10.
• ***Summary:*** Section II, titled "Policy" states (p. 1-2): "Research, both agronomic and entomological, on coconuts, rice and soya beans continued throughout the year..."

In Section VIII, titled "Research and special projects," the subsection on "Rice investigations" (p. 10) notes that when rice was grown in rotation with soya beans or *Crotolaria* species, yields declined less than when it was grown continuously, but lodging was greater. Address: Honiara.

582. Perry, T.R. 1965. Soybeans in Australia. *Soybean Digest.* July. p. 18.
• ***Summary:*** "Cultivation of soybeans in Australia dates back to early in the century but first commercial production commenced in the Kingaroy district of Queensland in 1951. Acreage early was restricted because of unsatisfactory returns and limited markets–all beans being purchased for edible uses in soy flour and similar products.

"With the entry of the vegetable oil crushers into the market in 1962, the guaranteed price scheme and assured market offered by the Linseed Crushers' Association of Australia resulted in rapid rise in acreage and increased interest in soybeans in all states.

"In Queensland and northern areas the soybean is primarily grown under natural rainfall, but in southern areas interest has been promoted in irrigated areas by the Crushers' Association." Address: Senior Agronomist, Linseed Crushers' Assoc. of Australia.

583. Virendrasingh, Maharajkumar. 1965. Soybean–The crop without a peer: Answer to India's protein malnutrition. *Commerce (Bombay)* 111(2852):A120-A122. Dec. Annual number at back of volume. [13 ref]

• ***Summary:*** One of the oldest known crops, the soybean dates back about 5,000 years. It was first described in a materia as long ago as 3838 B.C. prepared by the Chinese Emperor Sheng-Nung [sic], who was known as the "Heavenly Farmer."

"Soybean eaters are more physically fit and have more stamina than people who subsist on rice, millet and other grains."

In 1804 the soybean was introduced to the USA [sic]. In 1898 many soybean varieties were imported and tested, but not until 1924 did it enter into the official record [sic], "according to pioneer, Bill Baker from California of soybean fame." The USA discovered the value of soybean during World War I, but gave it its rightful place during World War II.

"In India, as nutritionists and agronomists came to know of the immense possibilities and nutritional value of the soybean, attempts were made to grow it, but it has not caught on, perhaps because the varieties tried were unsuitable for propagation in the soil and climate of our country. Further, there was no ready market to take the small produce and it did not prove of economic advantage.

"High nutritive value at low cost: The soybean can be virtually regarded as 'the miracle golden bean of the twentieth century,' because it is an oilseed with a high protein content. The country that has this crop on a major scale or can develop it need not worry about protein malnutrition among its people.

"The soybean has the supreme quality of being the only vegetable protein to possess all the essential amino-acids required for maintenance and growth. It is a complete vegetable protein like meat, milk, eggs and cheese,..."

"Research workers at the Central Food and Technological Research Institute at Mysore maintain that the soybean contains twice the quantity of protein as the common pulses of India." For Indians today, the best source of oilseed protein from crops grown in India is the groundnut. "However, on equal production per acre, the soybean yields twice the quantity of protein. Therefore, if soybean growing can be developed, we stand a better chance of meeting the protein needs of our people.

"Uses in Indian diet: The Indian diet has a preponderance of cereals, especially rice and wheat, which of themselves do not have enough proteins and protective elements to build and maintain health.

"The soybean is described as the poor man's meat."

"Other protein products developed recently are soy beverages and soy soups. Soy beverage can replace milk. Two tablespoons stirred in a glass of water can provide the protein deficiency in our diet. Soy protein fibres have been developed and when flavoured can be so prepared that vegetarians can have the pleasure of having chicken and meat made from vegetable protein.

"Miss T. Phillip, Principal of the Institute of Catering Technology and bean Council of America, Inc., provided. The work was sponsored by us. These products can be incorporated in popular Indian dishes as *Nimki, Sev, Samosas, Pakoder, Sambar, Alu Chole, Batata bhajee, Dalwada, Rava dosa, Oppuma* and sweets like *Ladoo, Shakarpara, pooran poli, Sooji Halva.* Soy flour did well in bakery product. Miss Phillip has reported excellent acceptability."

Soybean is an excellent source of low-priced, edible vegetable oil. "The first ever major agreement by the U.S. for the supply of soybean oil to India was signed on 30th September 1964 for a quantity of about 75,000 metric tons valued at about Rs. 9 crores. The oil began coming in March 1965. The price has averaged Rs. 1,525 a metric ton inclusive of freight and duties. On the whole, it has been half the price of domestic peanut oil. It has helped the *vanaspati* industry to meet its requirement of raw materials... Soybean oil helped to keep the price of *vanaspati* at a reasonable level as compared with liquid edible vegetable oils. The industry has approached the Government of India to request for another 150,000 metric tons of U.S. vegetable oil, and it is hoped at the time of writing this that it will come through. U.S. vegetable oil can be supplied under title I of P.L. 480."

Contains a long quotation by Glenn H. Pogeler, President of the Soybean Council of American, in a Dec. 1964 address to the Delhi Fats and Oils Symposium. It begins: "The United States consumer pays a smaller proportion of his income for food than any other consumer in this world."

Tables show: (1) India: Production of the five major oilseeds and their products (1958-59 to 1963-64)–Groundnut (by far the largest), rape and mustard, sesamum, linseed, and castor seed. (2) Oilseed yields (pounds per acre) of the above five (1958-59 to 1963-64): Peanuts (in the shell) have by far the largest yield–622 to 727 pounds/acre. (2A) Cost of protein content of major foods (wholesale on world market): The 3 least expensive sources (in U.S. cents per kg) are defatted soybean flour (40), fish flour (50), dried skim milk (51). (3) USA soybean oil and meal, supply and disposition. (3a) Consumption per caput per annum of (visible) food fats and oils (in lbs.): Netherlands 70, West Germany 56, Australia 49, USA 46, India 11. Address: Director for India, Soybean Council of America, Inc.

584. **Product Name:** Soya Bean Luncheon Loaf, and Savoury Roast (Meat Substitutes).
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: 729-1738.
Date of Introduction: 1965.
Ingredients: Incl. soybeans, tomato sauce or puree.
Wt/Vol., Packaging, Price: Tin-plated steel can.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. Vincent R. Smith was a soyfoods pioneer in Australia. Between 1965 and 1974-75 Mr. Smith developed and manufactured two soyabean meat substitutes–Soya Bean Luncheon Loaf, and Savoury Roast–for Bellevue Health Supplies, as part of his product range within F.A. Robert's Health Foods Proprietary Ltd. This latter company has since been absorbed within Soy Products of Australia Pty. Ltd.

585. Thrower, S.L. 1965. Translocation of labelled assimilates in the soybean. IV. Some effects of low temperature on translocation. *Australian J. of Biological Sciences* 18(3):449-61. [21 ref]*
Address: Univ. Melbourne.

586. Clark, Linda A. 1965. Get well naturally: Nature's way to health. New York, NY: Devin-Adair Co. 408 p. Index. 22 cm. Foreword by Royal Lee (D.D.S., Lee Foundation for Nutritional Research, Milwaukee 3, Wisconsin). [173+* ref]
• ***Summary:*** Partial contents: Author's note. Part I: Some unusual treatments. 1. Believe it or not. 2. How to be healthy. 3. Why drugs? 4. Who is to blame? 5. Is it safe to do it yourself? 6. Who can help you? 7. Homeopathy. 8. The biochemical sell-salts–flower remedies [Dr. W.H. Schuessler, Mira Louise of Australia, Dr. Edward Bach of England]. 9. Do herbs help? 10. Pressure therapy–acupuncture... 14. Stranger than fiction–The Edgar Cayce readings.

Part II: Health through nutrition. 15. Our "good" American diet. 16. Nutritional help for stress. 17. The magical mineral magnesium. 18. Macrobiotics. 19. When to begin nutritional therapy. 20. The star exercise.

Part III: Treating diseases naturally. 21. Alcohol and alcoholism. 22. Allergies. 23. Anemia... 28. Cancer. 29. Some little-known cancer treatments. 30. Constipation. 31. Eyes–How to see better. 32. Fallout–How to bypass it... 37. Heart ("Soybean oil is the only oil commonly used which is rich in linolenic acid [*Lancet* Nov. 7, 1964"]). 42. Overweight and fasting. 44. Miscellaneous natural remedies.

About the author (inside rear dust jacket): Under a large portrait photo we learn that her university training was in education, psychology, and nutrition (we are not told from which university). She is a busy housewife, mother, and grandmother. She writes a column for two health publications and edits a well-known health magazine. "For the past three years she has conducted a daily radio program on the West Coast and has spoken at nutritional meetings and conventions." Address: M.A., Carmel Valley, California.

587. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries. Annual Report (Port Moresby).* 1965. Division of Plant Industry. p. 40-123. For the years 1963-64. See p. 72-73, 96-97, 120.
• ***Summary:*** In the section titled "Highlands Agricultural Experiment Station, Aiyura" table 82 (p. 72) outlines seven crop rotation trials at Aiyura. Soybean and peanut were among the crops used. A paragraph on "Soybean variety trials" (p. 73) states that these varieties were planted in mid-April 1964 at Wabag, Korn Farm, Goroka, Gembogi, and Aiyura. The six varieties showing the most promise in earlier trials were planted at each site.

The section titled "Plant Introduction and Quarantine Station, Laloki" states (p. 96) that 9 bottles of Rhizobium inoculum for soybean were distributed to growers throughout the Territory. In addition, soils from various areas in the Territory were tested for the occurrence of bacteria able to nodulate some common legumes, including soybean (p. 97).

The section titled "Agricultural chemistry" contains a paragraph on "Soybean" (p. 120) stating that 21 samples of soybean were received from variety trials at the Highland centers of Aiyura and Laiagam. "They showed wide variations in oil and crude protein content between varieties and within the same variety between localities."

588. Linseed Crushers' Association of Australia. 1965? The soybean grower's guide. 67 York St., Sydney, Australia. 14 p. Undated. Illust. 22 cm. *
Address: Sydney, Australia.

589. *Today's Food (Loma Linda Foods, Riverside, California).* 1966. Celebrating our 60th anniversary [Loma Linda Foods]. 11(1):5 (back cover). Spring.
• ***Summary:*** Loma Linda Foods has been guided by the wise counsel of Ellen G. White, who began discussing healthful nutrition in 1863. "Actually, the nutrition work of Seventh-day Adventists, who own and operate Loma Linda Foods, began 100 years ago at Battle Creek Michigan... But the denominational affiliation with the old Battle Creek San breakfast foods ended in 1903 and it was not until 1906 that

it was reactivated at the Loma Linda Sanitarium in California. Here stoneground wheat bread and healthful cookies and fruit crackers were made in the sanitarium bakery, and in 1907 demand for the products from residents of the growing community forced the construction of a separate building. Here in a combination bakery and store, the business thrived for 30 years.

"Now known as Loma Linda Foods, the new factory continued making fine bread and cookies but added high protein products perfected to take the place of meat in vegetarian menus; whole grain breakfast foods; Breakfast Cup cereal drink [coffee substitute]; and about 1930, began making the first soy milk.

"Demand for Loma Linda Foods quickly outgrew the small delivery truck service developed within a 125 mile area, and when land for a new plant was offered by what was then La Sierra Junior College, ten miles west of Riverside, the move was made.

"Our present plant and Western Division general offices opened in 1938, and in 1951 the Eastern Division headquarters opened in Mount Vernon, Ohio. Developed for 25 years under the leadership of George T. Chapman from Australia, and now managed by Charles P. Miles, Loma Linda Foods is one of 30 food factories owned and operated by Seventh-day Adventists in Australia, New Zealand, South America, England, France, Denmark, Germany, Switzerland, Africa and Japan.

"Some 300 workers, plus nearly 100 salesmen, are dedicated to the production and distribution of more than three dozen tasty products bearing the Loma Linda Foods label..."

Color photos show: The general offices and main Loma Linda Foods plant at Riverside. Sales representatives and management personnel of the Western Division of Loma Linda Foods.

590. Wong, Edmon. 1966. Occurrence and biosynthesis of 4',6-dihydroxyaurone in soybean. *Phytochemistry* 5(3):463-67. May. [12 ref]

• ***Summary:*** A chalcone (isoliquiritigenin) and an aurone (hispidol) were found to be present in soybean seedlings. These substances appear to be phenolic constituents. Address: Plant Chemistry Div., D.S.I.R., Palmerston North, New Zealand.

591. Holsheimer, J.G.H. 1966. Growing soybeans in the Guadalcanal Plains: British Solomon Islands. *Soybean Digest*. June. p. 19-20.

• ***Summary:*** "Soybean seed was introduced into the British Solomon Islands Protectorate from Africa in 1961. More than a hundred varieties from different sources have now been planted at least twice in observation plots."

"History: Until 1961, the soybean was a crop which was almost unknown in the Solomons. Small plots were occasionally seen at Mission stations. In 1961, small quantities of seeds of 12 varieties were imported from Tanganyika, as a rotation crop with rice... In 1962 and 1963 variety and spacing trials were carried out. Yields varied from 1,071 to 2,092 pounds per acre... In 1963 private enterprise became interested and interest is increasing. At the beginning of 1965 89 varieties from various sources were sent to the Solomons by the Commonwealth Scientific and Industrial Research Organization in Australia... Yields varied from 220 to 3,020 pounds per acre."

Guadalcanal is one of the largest islands in the British Solomon Islands Protectorate. The plains begin east of Honiara, the capital. Farmers on Guadalcanal are now growing soybean commercially, small quantities have been exported, and acreage is increasing. One company plans to plant 500–1,000 acres in 1966.

Photos show: (1) Soybeans growing on Guadalcanal in an "observation plot." (2) A local woman planting soybeans in a spacing trial. (3) Soybean roots which have very few nodules if planted in virgin soil without inoculant. Address: Dep. of Agriculture, Honiara.

592. Kirchner-Dean, Otto. comp. 1966. Soybean processing and utilization: A selected list of references, 1955-1965. *USDA Library List* No. 83. iv + 183 p. Aug. Author index. Subject index. 28 cm. [2218 ref]

• ***Summary:*** Contents: Part I: Processing. Meal. Oil. Beans. Part II: Utilization. Meal in feed. Oil in feed. Beans in feed. Meal in food. Oil in food (General, margarine). Beans in food (general, flour, milk, soy sauce). Meal for industrial uses (general, coatings). Oil for industrial uses (general, coatings, drying oils, paints, resins, soaps). Beans for industrial uses. Part III: Chemistry and research. Amino acids, bibliography, biochemistry, chromatography, composition, enzymes, fatty acids, lecithin, lipides, lipoxidase, organic chemistry, pesticide residues, phosphatides, proteins, research, sterols. Part IV: Miscellaneous. Argentina, Australia, Brazil, California, Canada, China, Congo, cook books, Far East, government loans, India, industry, international trade, Japan, laws and legislation, markets and marketing, nutrition, pesticide residues, varieties.

"All citations except those to patents have been examined and verified by the compiler. Patents cited were obtained from Chemical Abstracts. All foreign language titles have been translated into English with the original language indicated. [Warning: Many patent titles listed in this are different from those appearing on the actual patent.]

"Sources consulted: Agricultural Index, Bibliographic Index, Bibliography of Agriculture, Biological and Agricultural Index, Card Catalog of the National Agricultural Library, Chemical Abstracts, Dissertation Abstracts, Engineering Index, Food Science Abstracts, Journal of the Science of Food and Agriculture, Nutrition

Reviews, and Pesticides Documentation Bulletin." Address: National Agricultural Library, Div. of Reference, Special Bibliographies Section.

593. Blair, I.D.; Tan, C.F.; Palmer, T.P. 1966. Soya bean trials in Canterbury. *New Zealand J. of Agricultural Research* 9(4):894-908. Nov. [19 ref]
• ***Summary:*** Begins with a summary of reports of soybean trials in New Zealand published from 1914 to 1939. The yields were not encouraging. A number of trials were conducted in Canterbury and other areas from 1958-1966. The yields of these improved varieties were more promising, but inoculation was a problem. Address: 1-2. Lincoln College, Canterbury, New Zealand; Crop Research Div., Dep. of Scientific and Industrial Research, Private Bag, Christchurch, New Zealand.

594. Simmonds, J.H. 1966. Host index of plant diseases in Queensland. Brisbane, Australia: Queensland Dep. of Primary Industries. 111 p. *
• ***Summary:*** The index is arranged alphabetically by host, and within each host by cause: fungi, bacteria, viruses, nonparasitic, or undetermined. The year in which the particular disease was first recorded and the name of the person responsible for its collection or identification are included. Leaf spot, wilt, stem rot, bacterial pustule, rust, seedling blight, soybean mosaic virus, and tomato big bud virus have been found on the cultivated soybean *(Glycine max)*. Address: Queensland, Australia.

595. Spencer, F.M. 1966. Policy. Marketing. Extension services. Research and other projects. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report*. For the year 1965. See p. 1-10.
• ***Summary:*** Section II titled "Policy" mentions (p. 1) that agronomic research on rice, cocoa, and soya beans continued throughout the year.

In Section IV titled "Marketing" the subsection on "Other produce" (p. 3) notes that "soya beans were sold both locally for pig food and overseas." A small quantity of groundnuts was sold in the Honiara market.

In Section VII, titled "Extension services" under "Food and other crops" we learn (p. 6): "Groundnut and soya bean seed were distributed on the islands of Choiseul and Kolombangara... On the Guadalcanal plains... soya beans... were grown under mechanised conditions."

In Section VIII, titled "Research and special projects" the subsection on "Rice investigations" (p. 9-10) notes that soya bean trials were conducted. "Of the various rotation crops tried during the year, soya beans continued to show most promise..." Address: Director of Agriculture, Honiara.

596. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby)*. 1966. Division of Plant Industry. p. 45-128. For the years 1964-65. See p. 78, 82, 93, 106, 114.
• ***Summary:*** In the section titled "Highlands Agricultural Experiment Station, Aiyura" is a subsection on "Soybean variety trials (p. 78) which states that trials were planted in April 1964 at Aiyura, Gembogl, Goroka, Korn Farm, and Wabag, comparing the six varieties which had yielded best in observation plots in the localities in 1963. A table shows the yield of each variety at the first four sites. The best yields were at Korn Farm.

As part of a pasture research program, three *Glycine javanica* strains were tested at Aiyura (p. 80). Soybean research has also been conducted in the past at Epo (p. 82). Small soybean variety trials were planted in the Markham Valley in May and October 1964 but both failed due to poor establishment (p. 93). Growers were supplied with soybean inoculum (p. 106).

A survey of insects on economic plants showed the following on soybeans: The polyphagous weevil *(Apirocalus cornutus)* was found in the Markham Valley (Morobe District). Dense populations of capsids *(Halticus* species) were recorded at Keravat (Lowlands Agricultural Experiment Station, on New Britain island).

597. Bentley, Orville G. 1967. Soybean production in the world–Limitations and potentials. *USDA Agricultural Research Service*. ARS-71-35. p. 2-19. May. Proceedings of International Conference on Soybean Protein Foods. Held 17-19 Oct. 1966 at Peoria, Illinois. [18 ref]
• ***Summary:*** This is the first paper in Session I, titled "Potentials for soybean production and use as related to world protein needs," Nevin S. Scrimshaw presiding. Contents: Introduction: "It is generally agreed by students of world food problems that the shortage of protein is the most critical need now and in the foreseeable future." Historical overview: Piper and Morse, Mildred Lager. An overview of worldwide soybean production: USA, Europe. Production in Eastern Asia: China, Indonesia, Japan, Taiwan, Thailand, India, Soviet Union, Latin America (Brazil, Paraguay), Mexico, Colombia, Argentina, Australia (no statistics given), Europe (European Russia, Bulgaria, Yugoslavia, Rumania, and Czechoslovakia).

Prospects for further production: USA, southeastern Europe, Russia, Thailand, Japan, Brazil, Colombia, Argentina, Mexico. Summary.

"In southern European Russia, commercial soybean plantings were reported in the 1870s. In the Far East, soybean cultivation may be even older as a part of the culture of the local Chinese. Before the revolution, acreage was small, however."

"Latin America is a relative newcomer in soybean production. Brazil is the only country where large acreage has been planted for more than a decade. In recent years soybeans have been planted in Argentina, Colombia, Mexico, Paraguay, and Surinam. Brazil is the major exporter with smaller amounts coming from Paraguay and Surinam. Venezuela is a major importer and Mexico imports some.

"Estimates for 1965 show that Brazil produced 16,610,000 bushels (453,000 metric tons), Mexico produced 2,482,000 bushels (67,690 metric tons), Colombia produced 1,835,000 bushels (50,000 metric tons), Paraguay 660,000 bushels (18,000 metric tons), and Argentina 360,000 bushels (9,800 metric tons). Total production of Central and South America would be only slightly more than 1 percent of world output. In Brazil about 90% of the production is concentrated in the state of Rio Grande do Sul, the southern-most part of the country. The balance is grown in nearby Santa Catarina and Parana. The climate is similar to some of our southern states... A major processing plant has been built near Porto Alegre."

"In Mexico, production began very recently. Almost all acreage is in the State of Sonora, bordering Arizona and Southern California. Here plantings started in 1959... In the Yaqui Valley, soybeans are always grown under irrigation where they fill in successfully as a second crop following wheat and cotton." In Colombia, acreage is concentrated in the Cauca Valley on the western slope of the Andes. In Argentina, acreage up to a few years ago amounted to about 1,000 hectares, most of which is grown in the state of Misiones, the far northeast area bordering upon Rio Grande do Sul in Brazil. In recent years there has been expansion in the pampas.

In the USA, "some expansion to the West is possible under irrigated conditions. Research trials in Oregon, Washington, and California show yields as high as 80 bushels an acre. But where water is limited, the highest value crops will be favored." Address: Dean, College of Agriculture, Univ. of Illinois.

598. Romano, I. 1967. Soybeans in Queensland, Australia. *Soybean Digest.* May. p. 72-73.
• ***Summary:*** Soybeans have been in commercial production in Australia since 1951, when they were planted in the Kingaroy district of southern Queensland. Since that time the area planted has ranged from 2,000 to 7,000 acres, with yields of good crops ranging from 15-20 bushels/acre. The single greatest barrier to expansion of the crop is the low returns per acre. Today soybean production in Queensland is still concentrated in the Kingaroy district, where it is found that the crop is profitable only if the yield is 20 bushels/acre or more. Presently the entire crop is grown under dryland conditions [without irrigation]. It could be that future expansion will occur only where irrigation is available.

Until 1964 almost all of the soybeans grown in Australia were grown in Queensland. They started to be grown in New South Wales during the summer of 1964-65. Address: Agronomist, Dep. of Primary Industries, Brisbane, Australia.

599. *Soybean Digest.*1967. Have crushed soybeans in Australia only 3 years. May. p. 73.
• ***Summary:*** The soybean crushing industry in Australia is new, and soybeans have been processed there for only 2-3 years. Fairly large amounts of soy oil are imported into Australia, largely for industrial uses such as in paints and synthetic resins. Current annual usage (1964) is estimated at 700,000 gallons, as follows: paint 560,000, synthetic resin 105,000, and other 35,000.

Soybean production in Australia has so far met with very limited success; only 2,000 to 5,000 acres have been planted in recent years and only about 1,000 tons of seed have been harvested. Most soybean production is in Queensland, in the vicinity of Brisbane.

600. Spencer, F.M. 1967. Marketing. Extension services. Research and special projects. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* For the year 1966. June. See p. 3, 6, 10, 11.
• ***Summary:*** In Section IV, titled "Marketing," under "Other produce" (p. 3) states: "18... soya beans were sold both locally for pig food and overseas."

Section VII, "Extension services," under "Food and other crops" (p. 6) notes that Guadalcanal Plains Ltd. planted 588 acres of soya beans, which yielded 840 lbs/acre. "Soya bean yields were low because of severe drought conditions experienced between June and October."

Section VIII, "Research and special projects," under "Rice investigations" (p. 10) states that further trials of rice and soya beans were conducted.

Also discusses: A small quantity of local groundnuts, which were sold readily at the Honiara market (p. 3). Address: Director of Agriculture.

601. *British Solomon Islands, Department of Agriculture (Honiara).*1967. Experimental growing of rice and soyabeans. 28 p. For the period June-Dec. 1966. See p. 2-4. *
• ***Summary:*** Pages 2-4 state that the average yield of soyabeans planted in May was 1,493 lb/acre, compared with 693 lb/acre for those planted in June; the later planting was more affected by drought. The crop planted in May flowered and matured more quickly than the one planted in June. HLS varieties performed best when sown in April/May and CSIRO varieties best when planted in June/July.

602. *British Solomon Islands, Department of Agriculture (Honiara).*1967. Rice and soyabean report. 17 p. For the First Growing Season 1967. See p. 8. *
• ***Summary:*** Page 8 states that, for a commercial venture, the average yield of soyabeans was 900 lb/acre and of

upland rice was 1300 lb/acre.

603. *SoyaScan Notes.* 1967. Chronology of Arran Stephens: Early years in preparation for work with natural foods, vegetarianism, and Lifestream Natural Foods Ltd. (Vancouver, then Richmond, BC, Canada). Part I (1944–1967). Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** The focus of Arran's life has been his spiritual practice; his work with food has taken an important supporting role as service to others. He has written his autobiography, published as *Journey to the Luminous: Encounters with Mystical Adepts of our Century* (Seattle, Washington: Elton Wolf Publishing. 1999. 380 p. with 70 black and white photos). An expanded version, titled *Moth & The Flame: Adventures with Spiritual Adepts of Our Time* is now available free of charge on the Web at www.ArranStephens.com.

1944 Jan. 6–Arran Blackburn Stephens is born in Duncan, on southeast Vancouver Island, British Columbia, Canada–at King's Daughter Hospital, about 10 miles from the family farm. He is the youngest of three brothers, the others being John Rutherford Jamieson (Gwen's son from her first marriage. John was born on 20 Sept. 1931 in New Zealand, the son of William John Jamieson, a New Zealand sheep farmer) and Godfrey (born on 28 Oct. 1939). Arran's father, Rupert Edward Cripps Stephens, was born on 4 April 1896 in or near Plymouth, UK. Arran's mother, Gwendolyn Minnie Elise Hopkins was born on 4 Nov. 1909 in Kent, King Co., Washington. Arran's parents run Mountain Valley Farm, the family farm of 89 acres of hard living they inherited from Rupert's father; there they grow field berries. Rupert had been a captain in World War I and saw some brutal action in Belgium and Germany; he would never talk about it. Rupert's father, "Surgeon Commander, Dr. Harold Frederick Dale Stephens," was in the Royal Navy and saw action in the Boer War in South Africa. Arran's paternal grandmother (his father's mother), Agnes Grace Cripps, daughter of Lieut.-General J.M. Cripps and Agnes Grace Cripps, had been born in about 1857 in Peshawar, in India's North-West Frontier (in today's Pakistan). Agnes married Lt. General J.M. Cripps, who had lived in colonial India from 1839 to 1878. General Cripps wrote a book titled *Recollections of My Indian Career,* illustrated with 25 exquisite original watercolors by his wife, Agnes. Aaron later wrote: "In my child's mind's eye, India's mystery beckoned, like a distant voice from a faded dream."

At Mountain Valley Farm, the Stephens family lives in a "hand-hewn log-house, overlooking the Goldstream Valley," surrounded by natural beauty, a waterfall, and wilderness.

1947–When Arran is age 3, the family sells Mountain Valley Farm and moves to Goldstream, about 40 miles south, closer to Victoria, where they wrest Goldstream Berry Paradise farm from the forest. Arran's parents have renounced modern chemicals and mechanization, finding simple, economical methods (such as sawdust mulch and earthworms) to strengthen soil fertility and the health of plants. Rupert's credo is: "Always leave the soil better than you found it." They establish a roadside "berry stand" from which to sell their berries and other produce directly.

1951–Rupert's treatise *Sawdust is My Slave,* is published extolling the methods he had discovered. When not working the land, Rupert wrote the lyrics for hundreds of songs, poems, and articles.

1955–After attending a Christian Bible camp Arran's interest in God begins to awaken. He feels called to the ministry. His dad takes him to a pristine forest behind their farm and tells him: "Arra-boy, this is our church; this is our cathedral."

1957 Jan.–The family (with Arran age 13) sells the farm (Goldstream Berry Paradise) and moves from Vancouver Island to Southern California. "The songwriter in Rupert's heart was restless for fame and Hollywood." The family settled in a "rented palm-shaded hacienda in the Hollywood Hills." Arran quickly learned to his dismay that violent gangs controlled the schools and streets. This urban concrete jungle was a different world.

1959–At age 15, Arran's "secure, trusting world abruptly ended: mum and dad separated" (temporarily). Brother "Godfrey roared off on his Harley motorcycle for New Orleans [Louisiana] and high adventure;" he later became a renowned artist. Confused and desperate, Arran decided to become an artist and poet. He encountered the Beat generation and the counterculture of the 1960s.

1961–Arran (now 17) has one of his poems published in the *Mendicant Poetry Journal.* He struggles to navigate the psychedelic 1960s, becomes a spiritual seeker, reads books of many spiritual traditions, meets Eden Ahbez, the first vegetarian he had ever met, "part of a handful of health and fitness devotees from the Hollywood Hills, including well-known Gypsy Boots and Al Jacobson. But every hope, each oasis, turned into an empty mirage." "Often broke, I slept on the beach, drunk or high on cheap wine or high on drugs, sometimes crawling into a cardboard box to mitigate the winter cold. When hungry, I ate discarded food or begged. When I could I painted. Misery was my companion,... a course which took but two years to break mind, body, and spirit." By age 17 he "was a haggard alcoholic and drug-dazed atheist railing against the Author of pain." One day he tried to end it all in the Ocean waves off Venice Beach in California. But after a momentary experience of serenity, he pulled back from the brink.

Then he heard of a monastic retreat named Fountain of the World in the hills above smoggy Los Angeles. One week after his arrival he had an experience that profoundly changed the course of his life. During an evening group Concentration, he experienced brilliant light and "intoxicating waves of Unconditional Love... This was my first taste of a state of Reality–something beyond the senses; something beyond intoxication; perhaps something I had always been blindly hoping and groping for." Similar experiences returned repeatedly but were not encouraged by his fellow monastics. After two months, and increasing pressure to "renounce the world and become a full-fledged monastic brother," he decides to leave.

1963–In San Francisco, Arran experiences how this spiritual light can miraculously save the life of a person about to be run over by a bus. He "never hesitated to investigate any teacher, religion or teaching." "From 1961 to 1964, with one or two exceptions, the springs of Divine Light all but dried up as this prodigal profligate wandered and squandered the spiritual capital we all come into the world with."

1964 April–Arran's parents, now back together, move back to British Columbia from southern California. They now live in Victoria on Vancouver Island.

1964–Arran (now 20) has several one-man shows of paintings under his belt. He leaves San Francisco for lovely Mendocino County, then, en route to Tangiers, he arrives in New York's Greenwich Village–almost broke. He paints and reads spiritual books. After a two-year lapse he starts daily sitting meditation again. Many brief and isolated inner experiences of light and peace lifted him "above an otherwise sordid existence." Craving discipline and order, he joins a group and for 9 months studies Gurdjieff whose "principal teaching was that we are all 'asleep,' and must awaken in a higher sense through various esoteric practices, including self remembering and sacred dance." He earns money at odd jobs, including as a waiter in a macrobiotic restaurant, the Paradox (owned by Richard Lane). Arran becomes interested in the vegetarian aspect of macrobiotics. He recalls (2006): I "largely ate macrobiotic for years at a stretch, but I also experimented with various diets, such as vegan, mucusless (Arnold Ehret), fruitarian, raw foods, and some fasting." But increasingly he yearns to meet a living perfect master and experience mystical union with God. After reading about Sri Ramakrishna, he gives up his bad habits and returns to being a vegetarian.

"From 1964 to 1965 my life revolved around art and the inner quest. One day, when shown photos of Hazur Baba Sawan Singh (1858-1948) and his disciple, Kirpal Singh (both great Sikh masters), and given a book by the latter, he is deeply moved. When he learns that Kirpal Singh is alive, he knows has almost found what he has been looking for. Meeting the Master in person became his passion. He writes Kirpal Sing (in India) asking for initiation.

1965 March 28–Arran receives a written reply, with instructions. "I was accepted for initiation... My feet were on the Path at last." He meditates, keeps a diary, and writes questions to his Master. Written answers return. He returns to Vancouver and opens the East West Gallery, eager to save enough money to go to India.

1967 Jan. 20–He departs for India, welcomed by his Master. He stays at the Master's Sawan Ashram, in Shakti Nagar, near Delhi, and has many wonderful experiences, beautifully and humbly described in detail. Most important are love, attending satsang, practicing meditation, not creating either bad or good karma, and weeding out personal shortcomings. Part of the practice is to eat a vegetarian diet and avoid all intoxicants. After exactly 7 transforming months in India he returns home. "Before leaving India, the Master authorized me to begin work as his representative in Western Canada." Continued. Address: Vancouver, BC, Canada.

604. *Soybean Digest.* 1968. Carroll, developer of combine, is dead. April. p. 52.
• ***Summary:*** Tom Carroll, developer of the modern self-propelled combine, died last month in his native Australia at age 79. In 1937 he designed his first self-propelled combine for what was then the Massey-Harris Co. His death came 7 years after he retired from Massey-Ferguson as chief engineer of the harvesting equipment section. He had served the company for 50 years. A small portrait photo shows Tom Carroll.

605. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1968. Marketing. Agricultural production. Research and special projects. For the year 1967. June. See p. 3, 5, 12.
• ***Summary:*** In Section IV, titled "Marketing," under "Other produce" (p. 3) states: "20... soyabeans were sold both locally for pig food and overseas."

Section VI, "Agricultural production," under "Other crops" (p. 5) notes: "Commercial crops of rice and soyabeans grown on the Guadalcanal Plains by a local company [Guadalcanal Plains Ltd.] were harvested during the year and produced 203 tons of rice and 440 tons of soyabeans."

Section VIII, "Research and special projects," under "Rice investigations" (p. 10-11) states: "100. In the dry season three soyabean variety trials were planted. Unfortunately very wet conditions occurred soon after planting leading to very uneven establishment of the trial plots. Mean yields varied from 1,917 lbs/acre to 771 lbs/acre."

606. Brewster, Louis R. 1968. U.S. soybean meal in Australia. *Soybean Digest.* Aug. p. 29.
• ***Summary:*** Much U.S. soybean meal is exported to Australia in 100 lb sacks, which are well liked because they leak and tear. The meal is facing increased competition from low-prices South African fish meal. "Piggeries," as they are called in Australia are just coming into their own, and they do not yet use much soybean meal. The author sees a bright future for soybean meal in Australia, especially if the U.S.

helps the country solve the problem of packaging, assists in development of the broiler and swine industries, and maintains competitive prices. Address: Vice President, Wellens & Co., Minneapolis, Minnesota, MN.

607. Geddes, R. 1968. Rates of attack of some α-amylases upon various substrates. *Carbohydrate Research* 7(4):493-97. Aug. [10 ref]
• ***Summary:*** "The α-amylase enzymes which are obtained from a wide variety of sources (animal, plant, and micro-organisms) may be expected to differ more from each other than do the β-amylases which are only obtained from higher plants. The initial action of α-amylases on amylose has generally been considered to be random, such that the long chain is attacked indiscriminately throughout its length with the production of shorter chains."

This short article describes a simple method for comparing the activities of α-amylases from various sources. Address: Dep. of Physical Biochemistry, John Curtin School of Medical Research, Australian National Univ. Canberra, Australia.

608. *Soybean Digest.* 1968. Worldwide oils and fats. Sept. p. 81.
• ***Summary:*** Discusses the situation in Eastern Europe, Korea, Australia, and Iran.

"Poultry farming is one of the most advanced areas of agricultural industry in Iran, but product prices tend to be relatively high in comparison with other countries. Iranians pay an equivalent of ten times as much as U.S. citizens do for a pound of poultry."

The Soybean Council of America has suggested improving the feed formulation used as well as overall operating efficiency. A photo shows Council Vice President Ferenc Molnar visiting a poultry farm near Tehran.

609. Bates, Richard D.; Barrett, W.W.; Anderson, D.W.; Saperstein, S. 1968. Milk and soy formulas: A comparative growth study. *Annals of Allergy* 26(11):577-83. Nov. [13 ref]
• ***Summary:*** Discusses Mull-Soy (made with soy flour) and Neo-Mull-Soy (made with soy protein isolate), both manufactured by Borden, Inc. A detailed nutritional analysis of both products is given. Concludes the Neo-Mull-Soy "supported growth and development of infants comparable to that of children raised on the soy flour (Mull-Soy) or milk formulas. A significant advantage of the formula used here, formulated from a soy protein isolate, was a lower incidence of anal irritation and loose stools as compared to any other soy formulations." Address: 1-2. Southwestern Medical School, Univ. of Texas, Dallas, TX; 3-4. Borden, Inc., 350 Madison Ave., New York, NY 10017.

610. Byth, D.E. 1968. Comparative photoperiodic responses for several soya bean varieties of tropical and temperate origin. *Australian J. of Agricultural Research* 19(6):879-90. Nov. [9 ref]
• ***Summary:*** Investigations of the potential of soya beans in subtropical Australia (south-eastern Queensland) have been underway for several years. Two tests of a number of soya bean varieties under a range of different photoperiods showed that all varieties were capable of flowering under all photoperiods tested; thus, they appeared to be "facultative short-day genotypes. Differential varietal responses were not obtained for flowering time at photoperiods of less than 12 hours per day,..." Address: Div. of Tropical Pastures, CSIRO, Cunningham Lab., Mill Rd., St. Lucia, QLD, Australia. Present address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067.

611. Kimber, A. 1968. Soybean in the New Guinea highlands. *Rural Digest, Dep. of Agriculture, Stock and Fisheries, Territory of Papua and New Guinea* 10(1):13-7. [2 ref]*
Address: Highlands Agric. Exp. Station, Aiyura, Papua New Guinea.

612. *Queensland Department of Primary Industries, Annual Report.* 1968. Soyabeans. 28 p. For the year 1967-68. See p. 19. *

613. Queensland Wheat Research Inst. 1968. Soybean Conference: Summary of proceedings and technical reports. Warwick, Qld., Australia. 34 p. 34 cm. *
Address: Queensland, Australia.

614. **Product Name:** Soy Crunch (Breakfast Cereal).
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1968.
Ingredients: 1995: Soy grits, maize, rice, linseed, millet, arrowroot, soy fibre, sesame.
How Stored: Keep sealed. Store in a cool, dry, dark place.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. This company makes Soy Crunch (a breakfast cereal containing soy grits).

Package with Label and product information brochure sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. Label: "Roberts Soy Crunch. 7 by 9 inches. Yellow, red, black, and green on white. "A gluten free, cholesterol free cereal. Suitable for the whole family." 500 gm net.

Information brochure: "'Soy Crunch' evolved in the 1960's alongside Soy Products of Australia's pioneering introduction of Muesli to Australia. Intended as a halfway house–flavour and texture wise–between Roberts' 'Vita Elm' and Muesli products, it aimed for a combination of higher fibre and vegetable protein..."

615. **Product Name:** Muesli (Several Types Containing Soy Grits; F.G. Roberts', Vogels, Vitaplex).
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1968.
Ingredients: Incl. soy grits.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. This company makes several types of Muesli containing soy grits.

616. Williamson, A.J.P. 1968. Soybean well worth greater attention. *Queensland Agricultural Journal* 94(11):655-63. *
Address: Australia.

617. Hon, Hazel. comp. 1968. Three week vegetarian menu. Sydney, Australia: Published by the author. 88 p. 24 cm.
• ***Summary:*** This Seventh-day Adventist vegetarian cookbook uses lots of canned Adventist food products, gluten, and whole soybeans. The Four Basic Food Groups (p. 7) are fruits and vegetables, cereal and bread, protein (including legumes, cottage cheese, eggs, soy cheese, nuts, peanut butter, and various manufactured nuts, soybean and gluten products), and milk groups ("use milk or a suitable alternative such as soybean milk").

A table titled "Seasonings" (p. 8) divides them into (1) Not irritating. (2) Slightly irritating. (3) Strongly irritating: Cloves, ginger, paprika (Hungarian). (4) Irritating, stimulating, harmful: Cayenne pepper, chili pepper, horseradish, mustard, pepper (black or white). (5) Seasoning herbs: Oregano, tarragon, chervil, sage, basil or sweet basil, bouquet garni, marjoram, rosemary.

A table (p. 9) lists "Goods obtainable at all Sanitarium health food shops" including gluten flour, soya flour, Soyagen (liquid or powder). Sanitarium canned foods: Nutmeat, Nutolene, Soya Beans, Vegetarian Sausages, Lima Beans. Worthington Foods: Soya Meat in tins. Chicken Style sliced. Chicken Style diced. Beef Style sliced. Beef Style diced. Loma Linda: Vegelona, and Linkettes.

Three weeks of menus and recipes are given. Soy-related recipes include: Soya nut loaf (p. 30). Soybean omelette (p. 65). Soya vegetable loaf (p. 70). Soya mayonnaise (p. 71). Soya oven croquettes (p. 82).

Note: This is the earliest document seen (Oct. 2004) concerning the work of Sanitarium Foods in Australia with soy. Address: 54 Castle Howard Road, Cheltenham, N.S.W., Australia.

618. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby).* 1968. Division of Plant Industry. p. 31-130. For the year 1965-66. See p. 31, 67, 105, 111.
• ***Summary:*** Agriculture is the country's main industry; agricultural exports contributed 86% of total export income in 1965-66. Coconut products were most important, followed by cocoa and coffee. This department is divided into four divisions: Animal Industry, Plant Industry; Extension and Marketing; and Fisheries; together with an Administrative Section (p. 1). A map (facing page) shows the Territory of Papua New Guinea and the surrounding islands that are part of it.

In 1965 a soybean variety trial was conducted at Keravat (p. 67). Six varieties from Aiyura were planted from 6-11 August and compared. A table shows the results in descending order of yield (in lb/acre): C.N.S. (1,389). Glycine 317 (1,058). NG 4662 (1,050). Avoyelles (1,034). Batavian Yellow (954). Coral Sea (699). The table includes the moisture, fat, protein, and ash content of each variety.

At Aiyura, all varieties were planted to maintain seed.

The section on "Plant introduction and quarantine" contains a table (p. 105) showing that, among the oil crops, 2 soybean varieties were introduced during 1965-66.

Trials were conducted to test the efficiency in nitrogen fixation of *Rhizobium* strains on various tropical legumes, including *Glycine max* (soybeans) and *Glycine javanica* (p. 111).

619. Queensland Dept. of Primary Industries. Marketing Services Branch. 1968? Report on peanuts, navy beans, soybeans. Queensland, Australia. *
Address: Queensland, Australia.

620. Barnes, Harris H., Jr. 1969. President's report: Let's put our men where the action is. *Soybean Digest.* April. p. 4-5.
• ***Summary:*** "New marketing organization: Recently in Washington [DC], in company with Sheldon Houck, representing the National Soybean Processors Assn., final plans were made for closing the Soybean Council of America office as of June 30. The work of this office will be taken over and expanded by the newly named American Soybean Institute, a market development organization, conceived by the American Soybean Assn. in St. Louis [Missouri] last December.

"The sole purpose of the new organization will be to increase sales of whole soybeans and soybean meal and soybean oil all over the world, including the U.S.

"ASA members think this is the time for action. Never was there a time where unity in the soybean industry was needed as much as today. With this in mind we have asked the processors–who along with the growers will be the greatest financial contributors to this agency–to band together with the exporters and country elevators and the terminal elevators, the exporters and transporters of soybeans, the soybean trade such as farm machinery, chemicals and fertilizers, the national farm organizations, extension service, research and Foreign Agricultural Service.

"It is felt that this band of interested soybean people can pool knowledge and be able to come up with concrete recommendations where market development money should be spent and in what amounts.

"As I write this, Chet Randolph, our executive vice president, is winging his way to Japan to supervise our activities there, under the capable leadership of Scott Sawyers, our Far East director. From Japan, Chet will move on to Taiwan where we hope to do our next market development work in the Far East.

"Markets in Europe:

"Europe will be included in Chet's trip this time as we contemplate new markets and the enlarging of markets which we will take over from the Soybean Council as more funds from growers, processors, and agribusiness become available to ASI.

"Money is the only thing that keeps us from moving right now into countries like Taiwan, Iran, Egypt, Turkey, Yugoslavia, Australia, and North Africa... to mention several."

"If we are to sell soybeans, we have to have people where the action is... in purchases of soybeans and soybean products! It takes big money to open offices in spots where we need them. And the grower must be motivated in the direction of market development.

"In the fall we are going into our Phase 2 program, that of collection of the ½¢/bu at first point of sale... the elevator or the oil mill. Your help will be greatly appreciated as you visit with your neighbor and with your good friend, your elevator operator." Address: President, American Soybean Assoc.

621. Dougherty, Charles T. 1969. The influence of irrigation, row spacing, plant population, and inoculation on the yield of soybeans in Canterbury. *New Zealand J. of Agricultural Research* 12(2):367-80. May. [16 ref]

• ***Summary:*** Harosoy and Chippewa soybean were grown at Canterbury in 1966-67. Higher yields were obtained from soybeans grown in rows 20 inches apart at populations of 110,000 plants/acre than from those grown in rows 40 inches apart with 60,000 plants/acre. Irrigation and inoculation did not increase seed yield. Address: Plant Science Dep., Lincoln College, Canterbury, New Zealand.

622. *USDA Plant Inventory.* 1969. Plant material introduced January 1 to December 31, 1967 (Nos. 317904 to 324307). No. 175. 262 p. July.

• ***Summary:*** Soybean introductions: *Glycine max* (L.) Merrill. Leguminosae.

322689-322695 (p. 184). From Angola. Seeds presented by Instituto de Investigacao Agronomica de Angola, Nova Lisboa. Numbered Sept. 18, 1967." C 8015. Improved. Origin unknown. Maturity 129 days. Nonshattering. Yield 2.550 kg. per hectare. C 8037. Bean No. 279. Origin unknown. Maturity 128 days. Nonshattering. Yield 2.550 kg. per hectare. C 8092. Jubiltan 109. Origin Mozambique. Maturity 129 days. Nonshattering. Yield 2.870 kg. per hectare. E 939. Max C.P.1159A8. Origin Australia. Maturity 128 days. Nonshattering. Yield 2.430 kg. per hectare. E 1151. Bicolor. Origin Angola. Maturity 117 days. Little resistance to shattering. Yield 2.290 kg. per hectare. E 1155. Hernon. Origin unknown. Maturity 126 days. Little resistance to shattering. Yield 2.290 kg. per hectare. E 1217. Bicolor do Cuima. Origin Angola. Maturity 118 days. Nonshattering. Yield 2.290 kg. per hectare.

323275-323278 (p. 196-97). "From Pakistan. Seeds collected by Ralph S. Matlock, Department of Agronomy, Oklahoma State University, Stillwater, Oklahoma. Received Oct. 11, 1967." Col. No. 7. Mirjanhat. Rawalpindi. Presented by Rafig Ahmad. Believed to be of Burmese origin. Yellow. Col. No. 12. Mothi. Ayub Research Institute, Lyallpur. Presented by Shamshad A. Kahn, Oilseed Botanist. Native species. Col. No. 14. K-16. Native variety. Seed small, black. Presented by Manzoor Ahmad A. Baluch, Associate Professor of Botany, Agricultural Research Institute, Tando Jam. Col. No. 15. K-30. Seed small, black. Presented by Manzoor Ahmad A. Baluch, Associate Professor of Botany, Agricultural Research Institute, Tando Jam.

323550-323581 (p. 208). "From India. Seeds collected by Theodore Hymowitz, Agricultural Experiment Station, University of Illinois, Urbana, Illinois. Received Nov. 15, 1967." 12 varieties from Nainital District, elevations 4,000 to 7,500 feet. 17 varieties from Almora District, elevations 3,300 to 5,900 feet. Seoni Yellow. Collected by P.L. Digarsey at Seoni, Madhya Pradesh.

323586-323587 (p. 209). "From Portugal. Seeds presented by Jardin e Museu Agricola do Ultramar, Lisbon. Received Nov. 15, 1967. Variety names: Dobrangeana, Sangora.

324066-324068 (p. 237-38) "From Rhodesia [Zimbabwe]. Seeds presented by J.R. Tattersfield, Department of Research and Specialist Services, Ministry of Agriculture, Salisbury Research Station, Salisbury. Received Dec. 6, 1967." Variety names: Geduld, Hernon 237, Hernon 273. Address: Washington, DC.

623. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1969. Marketing. Research and special projects. For the year 1968. Aug. See p. 3, 9.

• ***Summary:*** In Section IV, titled "Marketing," under "Other produce" (p. 3) states: "19... soyabeans were sold both locally for pig food and overseas."

Section VIII, "Research and special projects," under "Rice investigations" (p. 9) states: "96. Yields, bean size and oil content of the locally produced soyabeans have been disappointing." Use of urea, sulphur, and inoculant treatment increased yields by 94% over the control.

624. Hill, G.D. 1969. Soy bean yields in the lowlands of New Guinea. *Papua and New Guinea Agricultural Journal* 21(2):23-24. Sept. [2 ref]
• ***Summary:*** For many years, farmers in the Markham Valley of New Guinea have been seeking a suitable crop to incorporate into a rotation or to replace peanuts in the monoculture practiced on most farms. In 1964, two trials in the Markham Valley, designed to assess soy bean varieties in the wet lowlands, failed due to poor seed germination.

The following trial was conducted in 1968 in the wet lowlands at Bubia near Lae. Four varieties (obtained from Aiyura in Aug. 1968, inoculated with *Rhizobium* strain CB 1809, and planted on Nov. 7) were tested: NG 4661 Batavian Yellow, NG 4662, SHE 30, and Mission. The first three varieties yielded more than 1,500 lb/acre of soy beans. Address: Formerly: Agronomist, Dep. of Agriculture, Stock and Fisheries, Bubia, via Lae, Papua New Guinea. Presently Dep. of Agronomy, Univ. of Western Australia, Nedlands, W.A. 6009.

625. Palmby, Clarence D. 1969. Production and world sales of U.S. soybeans. *Soybean Digest.* Sept. p. 48-51.
• ***Summary:*** Discusses: How soybeans more than make up for declines in cotton production. Sales of soybeans to western Europe, Asia, and Oceania. The mistake in 1966 which raised the price support level from $2.25 to $2.50 per bushel. The threat of the proposed EEC internal consumption tax of $60/tonne on vegetable and marine oils, and $30/tonne on oil cakes. The growing importance of substitutes–especially those made from soybeans.

"The soybean is a typical American. It came as a lonely immigrant. It struggled in obscurity. Slowly it began to thrive–to succeed in its new environment–to become a part of the American scene. Finally, a century and a half after its first introduction, the soybean began the sudden expansion that has made it the second ranking income producer among cash farm crops. This is a phenomenon of only the past 20 years."

A photo shows Palmby. Address: U.S. Asst. Secretary of Agriculture for International Affairs and Commodity Programs.

626. *Soybean Digest.* 1969. Yield almost 50-bu. in Australia! Oct. p. 13.
• ***Summary:*** According to the *Sydney Herald* an Australian soybean yield record of 48.6 bu/acre was harvested on John Bligh's Anchorfield research station [farm] at Brookstead, Queensland. The crop was harvested in early July. The average yield from Bligh's entire 450-acre crop was expected to be 40 bu/acre. It was grown under irrigation but without fertilizer. Next December Mr. Bligh plans to plant 2,000 acres with fertilizer and irrigation. He made 3 trips to the U.S. to select seed. "Irrigation did little good until the problem of establishing the proper inoculants in Anchorfield's alkaline soils was solved." A photo shows Bligh.

627. Dougherty, Charles T. 1969. The influence of planting date, row spacing, and herbicides on the yields of soybeans in Canterbury. *New Zealand J. of Agricultural Research* 12(4):703-26. Nov. [9 ref]
• ***Summary:*** Soybean varieties Adelphia, Amsoy, and Wayne were grown at Canterbury in 1967-68. The highest seed yields (35 bushels/acre) under Canterbury conditions were grown at 20 inch row spacings. The results obtained from this and previous research in 1966 and 1969 indicate that soybeans are presently unable to compete with alternative crops that give higher profits with less risk. Address: Plant Science Dep., Lincoln College, Canterbury, New Zealand.

628. Holsheimer, J. 1969. Experimental growing and bulking of rice, soyabeans, sorghum, and cotton. *British Solomon Islands Protectorate, Department of Agriculture, Rice Report (Honiara)* 17 p. For the Second crop 1968. April/Dec. See p. 2-3, Appendix I and II.
• ***Summary:*** The section titled "Soyabeans" (p. 2) notes that some 132 observation plots were planted. Each soyabean variety was planted twice. 24 varieties had been planted previously and 42 varieties had been recently imported from Zambia, Southern Rhodesia, and Fiji. The seed of many of the newly introduced varieties had a low germination rate. The varieties that gave the best yields are listed. Only one (Wilson Black) has a name; the others are designated by initials or numbers. The yields are not given.

The next section titled "Fertilizer trials" (p. 2) begins: "Yields, bean size, and oil content of the locally produced soyabeans have been disappointing. Private enterprise has found the growing of soyabeans to be uneconomical and has ceased growing them. It was thought that with improved cultural methods, yields and quality may be improved."

Experiment II was conducted on land at Okea. Urea (200 lb/acre) and elemental sulphur (100 lb/acre) were applied and not applied. The variety was Light Speckled. Soybeans were inoculated or not. The highest yield (2,744 lb/acre or 45.7 bushels/acre) came from inoculated soybeans with the urea + sulphur treatment. These results were considered excellent.

Appendix I, titled "Soyabean observation plots I and II" has 126 entries and one column for each of the following: No. CSIRO No. Name [of variety] (incl. HLS, Seminole, Wilson Black, Yellow Kedele, CNS, Hernon, Palmetto, Sangalo, Hood, Hill, Gedulo, Hardee, Yellow Avoyelles, Halesog, Pelican). Origin (Tanganyika, Israel, Sudan, Congo, Southern Rhodesia, British Honduras). Planting date. Bean color. Time to maturity in days. Plant length in inches. Pods off the ground in inches. Lodging. Shedding leaves. Shattering. Yield (lbs per acre). Ripening. Remarks (esp. poor germination).

Appendix II, titled "Soyabean observation plots III and IV" has 110 entries and the same column headings. All came from Tanzania. Address: Agricultural Officer, Rice Experiments.

629. Dougherty, C.T. 1969. The influence of irrigation, row spacing, plant population and inoculation on the yield of soy beans in Canterbury. *New Zealand J. of Agricultural Research* 12(2):367-80. *

630. Dougherty, C.T. 1969. The influence of planting date, row spacing, and herbicides on the yield of soy beans in Canterbury. *New Zealand J. of Agricultural Research* 12(4):703-26. *

631. **Product Name:** Sanitarium Health Foods Vegetarian Rediburger (Canned Vegetarian Loaf).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1969.
Ingredients: Wheat protein, vegetable oil, wheat germ, soy protein, hydrolysed vegetable protein, dried yeast, salt, yeast extract, brown rice, onion, caramel, colouring, Savex.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. Photo shows a burger on lettuce and a bun topped with catsup and onion rings. "Vegetable Protein" Recipes for Company Roast and Golden Hot-Pot.

Letter and Label sent by Sanitarium Health Food Co. 1990, June 25. Gives product introduction date as 1969.

632. Brissenden, Rosemary L. 1969. South East Asian food: Indonesia, Malaysia and Thailand. Baltimore, Maryland, USA, and Harmondsworth, Middlesex, England: Penguin Books Ltd. 262 p. Index. 18 cm.
• ***Summary:*** Contents: Acknowledgements. A note on this American edition. Weights and measures. 1. Introduction to South East Asian Food. 2. Utensils, methods, ingredients, glossary. 3. Indonesia. 4. Malaysia and Singapore: Malay, Chinese, Indian, Miscellaneous Malaysian. 5. Thailand.

The glossary of ingredients contains descriptions of: Soya bean curd (fresh or dried), Soya sauce, and monosodium glutamate (also known as Ve-Tsin, Ajinomoto, Mei Ching, Taste Powder, Gourmet Powder, Accent, P'sst!, etc.). The 3 kinds of soya sauce used in this book are light soya sauce, dark soya sauce (which is thicker and heavier; these two kinds are available at Chinese grocers), and Javanese soya sauce, which is sweet and very thick. The latter is available in bottles named Ketjap Manis or Ketjap Benteng, under the Conimex label. To make your own Javanese soya sauce, combine 1 cup dark soya sauce, ½ cup molasses, and 3 tablespoons brown sugar in a small saucepan over medium heat. Stir until the sugar melts. Keep in a covered jar.

This book has a disproportionate number of recipes based on meat, fish, and poultry. Soy-related recipes include the following. From Indonesia: Ikan semur Djawa (Fish in soya sauce, p. 69, Java). Ajam semur Djawa (Chicken in soya sauce, p. 76-77, Java). Semur daging (Beef in soya sauce, p. 94). Tahu goreng ketjap (Fried bean curd with soya sauce, p. 105). Tahu pong (Bean curd omelette, p. 111).

From Malaysia and Singapore: Fried fish with soya beans (p. 149-50). Stirred tomatoes or silver beet with black beans (with Chinese black beans [soy nuggets], p. 169). Baked bean curd (p. 181). Steamed, dressed bean curd (p. 181-82). Address: Melbourne, Australia.

633. Evans, D. Warrington. comp. 1969. An account of a voyage round the world with a full account of the voyage of the Endeavour in the year MDCCLXX along the east coast of Australia, by James Cook. Brisbane, Australia: W.R. Smith & Paterson. xxix + [481]-660 + CCXII-CCXVI Illust. 30 cm. *
• ***Summary:*** This book includes a chart of New South Wales on the east coast of New Holland by James Cook, 1770, which is facing page 8. The Bay of Inlets is on this map. This account was originally compiled by John Hawkesworth (1715?-1773).

634. Hamner, Karl C. 1969. *Glycine max* (L.) Merrill. In: L.T. Evans, ed. 1969. The Induction of Flowering: Some Case Histories. Melbourne, Australia: Macmillan of Australia; Ithaca, New York: Cornell University Press. viii + 488 p. See p. 62-89. [117 ref]
• ***Summary:*** Contents: History of Use: Taxonomy, origin and cultivation. Growing techniques and growth habit: General, growing techniques, growth habit. Inflorescence structure and criteria of flowering response: Anatomical studies, criteria of flowering response. The effect of plant age. Vernalization and devernalization. Photoperiod response: Varietal studies, Biloxi soybeans. Spectral dependence. Endogenous rhythms: Early work, length of cycle experiments, light perturbation experiments,

interaction of light and endogenous rhythm, effects of red and far-red light, conclusions concerning control of photoperiodism. Fractional induction (apparently none occurs in soybeans). Photoperiodic inhibition. Effects of temperature: The relation between temperature and endogenous rhythms. Effects of mineral nutrition. Effects of gas composition. Grafting experiments. Effects of growth substances and growth retardants. Chemical, histochemical and ultrastructural changes at induction. Inflorescence differentiation. References. Contributors. Abbreviations. Address: Dep. of Botany, Univ. of California, Los Angeles, California.

635. Stuyvenberg, J.H. 1969. Aspects of government intervention. In: J.H. van Stuyvenberg, ed. 1969. Margarine: An Economic, Social and Scientific History, 1869-1969. Toronto, Ontario, Canada: University of Toronto Press. xxiv + 342 p. See p. 281-328. Chap. 7. [71* ref]

• ***Summary:*** Contents: The background. The United States: The crusade begins, the federal law of 1886, more far-reaching discriminations–1902 and 1931, out into the open sea. Germany: Introduction, the first acts of parliament, uncertainties arising from legislation, legislation during the depression, during and after the Second World War. The Netherlands: The legislation and its motives, the first acts of parliament, voluntary butter inspection–the indicator conflict, the wars and the depression, the position consolidated. The United Kingdom: Introduction, legislation up to 1914, the First World War and after, during and after the Second World War. Russia. The European Economic Community. Some other countries: New Zealand, South Africa, Italy, Denmark, Norway, France. Address: Prof. of Economic History, Univ. of Amsterdam.

636. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries, Annual Report (Port Moresby).* 1969. Division of Plant Industry. p. 39-145. For the year 1966-67. See p. 76-77, 119-20, 138.

• ***Summary:*** A paragraph titled "Soybean" (p. 76-77) states that a soybean spacing trial was planted at Aiyura in Dec. 1966. The best yields were about 1,500 lb/acre. Spacing results were inconclusive. At Tambul the soybean varieties NG4662, Avoyelles Black, Improved Pelican, Nondugl, Batavian Yellow, Hernon 49, SHE 30, Coral Sea and Mission grew slowly; they matured in 6-7 months to yield about 500 lb/acre. The varieties Riggit and CNS took about 11 months to mature and were therefore discarded.

The section on "Plant introduction and quarantine" contains a table (p. 119) showing that 4 soybean varieties were introduced during 1966-67. Several soybean varieties were received from the Department of Agriculture, British Solomon Islands Protectorate (p. 120).

Nutrition samples of 11 soybean plants were conducted.

637. Arora, S.K.; Sandhu, R.S.; Mehrotra, N. 1970. Chemical composition and correlation studies in soybean *(Glycine max* (L.) Merr.). *Indian J. of Agricultural Sciences* 40(1):54-58. Jan. [7 ref]

• ***Summary:*** Soybean seeds of 50 genetically diverse varieties were grown at the Oilseeds Research Substation, Kangra, during the rainy *(kharif)* season of 1966. These soybeans came from both India and abroad: Australia, China, Japan, USA, Nepal, Sikkim, Bihar (Pusa), Solan, Matina, Simla Hills, Punjab. A table shows for each variety: Yield (gm/plant), oil (%), protein (%), minerals per 100 gm, phosphorus (%), and calcium (%).

Note: Hissar is a town Haryana state, northern India, 100 miles west-northwest of Delhi. Address: Punjab Agricultural Univ., Hissar [Haryana, India].

638. *British Solomon Islands Protectorate, Department of Agriculture, Annual Report.* 1970. Research and special projects. For the year 1969. May. See p. 9.

• ***Summary:*** Section VIII, "Research and special projects," under "Cash and subsistence crop trials" (p. 8-9) states: "93. Observations continued on 152 soyabean cultivars, twenty-two of which are being bulked up and tested further. A considerable number of promising varieties are available to growers.

"94. This year no major or economic responses to fertilizers were recorded on soyabeans. The yields of control plots indicated a high level of soil fertility with no important limiting factors."

A groundnut variety trial is also mentioned (p. 9).

639. IRAT-RCA (Republique Centrafricaine). 1970. Soja: Généralités, variétiés [Soja: General information and varieties]. *IRAT-Republique Centrafricaine, Rapport Annuel* For the year 1969. Vol. II. Phytotechnie. p. 24-31. [Fre]

• ***Summary:*** IRAT stands for *Institut de Recherches Agronomiques Tropicales* (Tropical Institute of Agronomic Research). This is a summary of results obtained during previous years. Page 24 states: "The soybean is not well known in the Central African Republic [CAR]. Since 1963, two varieties, San-Kuo and Palmetto have been propagated at the Grimari station. The seeds were planted in May and August of each year on the multiplication plots on centers of 40 by 15 cm, at the rate of 80 kg of seed per hectare, with 40 kg of di-calcium phosphate and 60 kg of ammoniated phosphate fertilizer. The yields remained low, about 500 kg/ha. The only disposal of this production was the consumption by the troop at the station and by infant center *(Centre d'élevage)* at Bambari. In the zone of Agoudou Manga in 1968 some commercial planters undertook the cultivation of soybeans, but this operation was not continued.

In 1967 the Ministry of Development, considering the soybean to be a nitrogen source for the feeding of animals, requested that IRAT start experimentation again. The goal was to find a variety superior to Palmetto and San Kuo, and to find the best cultivation techniques, especially inoculation with soil bacteria. A list shows the 81 soybean varieties that were introduced to the CAR, including 54 from the USA, 3 from Brazil, 7 from Australia, 8 from Ecuador, 4 from Malaysia, 2 from South Africa, and 1 each from Taiwan, Nigeria, and Pakistan.

This collection of varieties was planted late, on June 13. In 1961, they were planted on May 11, and again on Oct. 29. By 1969 it was clear that the black-seeded variety Avoyelles (from Australia) gave the highest yields, the mean being 1,18 kg/ha. Other interesting varieties were Wilson Black, Palmetto, and San-Kuo. Table 8 shows the characteristics of each variety and Table 9 shows that the yield of Avoyelles could be increased to 1,519 kg/ha by inoculation and the use of fertilizers.

Note: This is the 2nd earliest document seen (Aug. 2009) concerning the cultivation of soybeans in the Central African Republic.

This document contains the 2nd earliest date seen for the cultivation of soybeans in the Central African Republic (1963). Address: Central African Republic.

640. Dinshah, Freya. 1970. The vegan kitchen. 6th ed. Malaga, New Jersey: The American Vegan Society. 44 p. Illust. Recipe index. Sept. Saddle stitched. 21 cm. The Ahimsa book series No. 2.

• ***Summary:*** With a bonus chapter: Why veganism? by Eva Batt. Page 6 notes that soya beans can be sprouted. The authors believe that the best way to eat cereal grains is to sprout them. In a section titled "About Vitamins" we read: "Some people, at least in the transition period, may wish to supplement the menus given, with a glassful of B-12 fortified soya-milk. In the USA, Loma Linda Soyagen and Worthington Soyamel are marketed in various flavors. In England there is Granogen, Velactin, and a leaf-protein milk known as Plantmilk or Plamil. (Plamil is now also being made available in North America)." Soy-related recipes include: Soya patties (with soya meal or flour, baked in an oiled dish, p. 20). How to shell green soya beans (p. 21). Soya loaf (with cooked soya beans, baked, p. 23). Soya milk (with soya powder/flour and dates, p. 24). Soya cheese Americana (tofu made with soya powder/flour and coagulated with lemon juice, p. 25). Australian soya cheese (tofu made with soya powder, coagulated with orange and lemon juice, jelled with agar-agar, p. 25). British Plantmilk cheese (tofu made with Plamil and lemon juice, p. 25). Vegan "mayonnaise" II (with soya milk and mashed potatoes, p. 26).

A lifetime vegetarian, the author has been a vegan since 1959, and the Secretary of the American Vegan Society since 1960. Married to AVS President H. Jay Dinshah, she is an accomplished author, lecturer, and teacher. Address: The American Vegan Society, 501 Old Harding Highway, Malaga, New Jersey 08328.

641. Bergersen, F.J. 1970. The quantitative relationship between nitrogen fixation and the acetylene-reduction assay. *Australian J. of Biological Sciences* 23(5):1015-25. Oct. [18 ref]

• ***Summary:*** Discusses: Soybean nodules, *Azotobacter vinelandii, Klebsiella aerogenes,* light intensity. Dilworth (1966) first showed that acetylene was reduced to ethylene by nitrogen-fixing systems. "It is concluded that caution should be observed in the application of the acetylene-reduction assay to quantitative determinations of nitrogen fixation. Major errors are likely to result when the conditions in the assays are not carefully matched with the conditions under which nitrogen fixation is occurring." Address: Div. of Plant Industry, CSIRO, P.O. Box 109, Canberra City, A.C.T. 2601.

642. Sault, J.L.; Gale, J.B. 1970. A review of developments in simulated meats. *Quarterly Review of Agricultural Economics (Australia)* 23(4):209-221. Oct. [42 ref]

• ***Summary:*** Contents: Introduction. Nature of simulated meat products: Sources of raw material, processing methods. Production and marketing: The United States market (where virtually all production has been based on soya bean protein), the Japanese market, the Western European market, other countries (South Africa, Canada, Australia). Factors influencing competition with natural meats: Differences in properties, increases in incomes and changes in tastes, relative prices, promotion, government regulations. Summary and conclusions.

"The United States and Japan are the two main producers of simulated meats and account for most of world consumption... Virtually all of the United States' commercial production of simulated meats has been based on soya bean protein." At least 15 companies made simulated meat in 1969, but six of these produce most of the items marketed. A number of the manufacturers (such as General Mills) are very large and have invested large amounts of time and money in the process.

In Japan, production of western-style simulated meats is a very recent development. Consumption of such items is still very small, though it appears to be rising. "In 1968 domestic production plus imports of simulated meats totalled 37.7 million lb, and during the first six months of 1969 they amounted to 25.9 million lb." Most of these products are made in Japan by at least 19 firms. One feature of the Japanese industry has been the importance of wheat gluten as a protein source. In 1968 and the first half of 1969 some 36% of Japan's output was derived from wheat gluten; virtually all of the rest was based on soy protein.

Sales of simulated meat products in Western Europe have been considerably lower than those in the USA and

Japan. The main developments have occurred in the Netherlands, West Germany, and Sweden. In the Netherlands, imports rose from 44,000 lb in 1967 to 1,166,000 lb in 1968, then fell the next year. In West Germany, simulated meats were first introduced to the trade and consumers in mid-1968.

"In South Africa one firm is manufacturing a simulated meat from soy protein by what appears to be a thermoplastic extrusion process. The product is being used as a meat extender rather than as a complete meat substitute. It is reported to be of a dry and wiry texture requiring a good deal of seasoning to make it palatable." Its price is higher than that of natural meat.

Note: This is the earliest document seen (Dec. 1997) that uses the term "thermoplastic extrusion" in connection with soy.

643. Khaleque, A.; Bannatyne, W.R.; Wallace, G.M. 1970. Studies on the processing and properties of soymilk. I. Effect of preprocessing conditions on the flavour and compositions of soymilks. *J. of the Science of Food and Agriculture (London)* 21(11):579-83. Nov. [16 ref]
• ***Summary:*** Sodium carbonate and sodium hydroxide significantly reduced beany flavour in soymilk. Harasoy variety soyabeans, grown in New Zealand, were used throughout the experiment. Address: Dep. of Food Technology, Massey Univ., New Zealand.

644. *British Solomon Islands Protectorate, Department of Agriculture, Rice Report (Honiara).* 1970. Soyabeans. 18 p. For the Second Crop 1969. See p. 7-9. *

645. Spilsbury, Calvin C. 1971. Markets for U.S. soybeans and soybean products in Asia and Oceania. *USDA Foreign Agricultural Service.* FAS-M 227. 27 p. Feb.
• ***Summary:*** Contents: Introduction. Hong Kong: The market for soybeans and soybean products, marketing problems. Indonesia: Production of oil-bearing materials, prospects. Korea (South): Domestic oilseed production, the oilseed crushing industry, use of soybeans for food, use of soybeans for feed. The Philippines: Domestic soybean production, the crushing industry, poultry and mixed feed industries. Singapore and Malaysia: Soybean crushing, shipping, feed production and use. Australia: Domestic soybean production, production of other oilseeds, oilseed crushing industry, mixed feed and poultry industries, margarine. New Zealand: Domestic oilseed production, feed situation and imports. Address: Fats and Oils Div.

646. Kaw, Ram Nath; Menon, P. Madhava. 1971. Variability of agronomic characters in soybean *(Glycine max* (L.) Merrill) at Coimbatore, S. India. *Madras Agricultural Journal* 58(4):281-90. April. [12 ref]
• ***Summary:*** "The data reported herein were collected from two sets of field plantings of 37 varieties from U.S.A. (22), Australia (7), Thailand (3), India (2), S. Africa (1), Nigeria (1) and China (1). The experiment was laid out in the Central Farm, Agricultural College and Research Institute, Coimbatore (11°N) during 1969-70..." Address: 1. Senior Research Fellow; 2. Prof. of Genetics. Both: Div. of Genetics, Agricultural College and Research Inst., Coimbatore, Tamil Nadu, India.

647. Krishnaswami, R. 1971. Introduction and evaluation of soybean varieties in Tamil Nadu. *Madras Agricultural Journal* 58(4):297-300. April. [3 ref]
• ***Summary:*** "A world collection of soybean germplasm consisting of 662 cultures was obtained and the material was screened at Coimbatore in 1968." Tables show: (1) Relative performance of some of the soybean genotypes adapted to Tamil Nadu. Of the five tested, three came from Thailand and two from Australia. The highest yield was 3,776 kg/ha. (2) Performance of some soybean genotypes in two different seasons at Coimbatore. The first sowing was done in March (summer) and the second in July *(kharif).* Of the five tested, two came from Australia, one from Italy, one from the northern USA (Clark-63), and one from the southern USA (Improved Pelican). A variety from Australia, grown during the summer, gave the highest yield. Address: Research Inst. Regional Station (IARI), Coimbatore-3, Tamil Nadu, India.

648. Hansen, Barbara. 1971. Interest in Asia carries into Kitchen. *Los Angeles Times.* May 20. p. J16.
• ***Summary:*** Rosemary Brissenden, an anthropologist from the Australian National University at Canberra, has written a book (a work of love) titled "Joys and Subtleties," about the foods and cookery of Southeast Asia, especially Indonesia, Malaysia, Singapore, and Thailand. In 1957 she "spent three months in Java and Bali with a student delegation from Australia." They lived with Indonesian families and ate their food. The recipes in her book "are as authentic as close observation of cooks at work could make them." Moreover they call for the same ingredients used by the Indonesian cooks, such as Javanese soy sauce, coconut milk, laos, lemon grass, trasi, tamarind, and curry leaves. These are now available in most big cities, mainly at Chinese markets.

Ms. Brissenden and her husband are just finishing a six month stay in Los Angeles.

649. McKay, S.S. 1971. An historical review of Australian development of farm machinery. *Agricultural Engineering Australia* 2(2):7-18. June. *

650. Wallace, G.M.; Khaleque, A. 1971. Studies on the processing and properties of soymilk. III. Factors affecting concentration of soymilk and its stability during heat

sterilisation. *J. of the Science of Food and Agriculture (London)* 22(10):531-35. Oct. [19 ref]
• ***Summary:*** Soymilk that has been adequately heated to destroy its trypsin inhibitor is difficult to concentrate because its viscosity increases exponentially with the increase in its solids content. At about 17-18% total solids, a gel-like structure is formed. It was found that the sulphydryl-disulfide interchange reaction is largely responsible for the increase in viscosity of the concentrate up to about 16% total solids, but above this level other forces predominated. The conditions necessary for the production of good quality canned soymilk are presented. The key is forewarming at 115ºC for 5 minutes prior to concentration. Address: Dep. of Food Technology, Massey Univ., Palmerston North, New Zealand.

651. Wallace, G.M.; Bannatyne, W.R.; Khaleque, A. 1971. Studies on the processing and properties of soymilk. II. Effect of processing conditions on the trypsin inhibitor activity and the digestibility *in vitro* of proteins in various soymilk preparations. *J. of the Science of Food and Agriculture (London)* 22(10):526-31. Oct. [26 ref]
• ***Summary:*** Pre-soaking the soybean in 0.4 M sodium carbonate solution for 24 hours as a pretreatment facilitated deactivation of trypsin inhibitor activity. Other effects of carbonate presoaking are also discussed. Address: Dep. of Food Technology, Massey Univ., Palmerston North, New Zealand.

652. Sastroamidjojo, M.S.A. 1971. An answer to world food crisis? *ANU Reporter (Australian National University)* 2(19). Nov. 26.
• ***Summary:*** "Mr. Setiadji Sastroamidjojo, a Colombo Plan student doing a PhD in physics, believes that commercial food producers are neglecting their responsibility by not taking up the large-scale production of tempeh, a soya-bean based food used by Indonesian people for the past 2,000 years.

"Mr. Sastroamidjojo believes that tempeh, if produced on a large enough scale and distributed throughout the underdeveloped areas of the world, could save countless thousands of people from hunger and possible starvation.

"Until recent years there have been problems of heat transference associated with the commercial production of the food, but Mr. Sastroamidjojo believes he answered these problems in his own research on the subject, the findings of which were published in Japan last year." He believes "that a wheat-based tempeh will be more acceptable to the people of western nations. He sees Australia as an excellent country in which to establish the commercial manufacture of tempeh." It has a surplus of wheat, is close to the obvious markets, and could develop sophisticated, automated process that would allow low-cost, large scale production. "Once the industry was established, Australia would not only be able to export dried tempeh but would be able to export the 'know-how' of its manufacture so that Asian and African countries may benefit." A total of 20 intestinal bacteria are said to be inhibited by tempeh. "Indonesians recognize it as a medicine for dysentery."

653. Williamson, A.J.P. 1971. Soybean is an expanding crop. *Queensland Agricultural Journal* 97(11):571-81. Nov. [1 ref]
• ***Summary:*** Contents: Introduction. Uses of soybean. Summer growing legume. Varieties. Description of varieties. Rotation. Soils, fertilizers and nodulation. Land preparation and tillage. Time of planting. Row and plant spacings. Planting. Pests and diseases. Irrigation. Harvesting. Yields. Seed handling and storage. Fodder and hay. Marketing.

"Soybeans have been grown commercially in Queensland for several decades but until 1969 the area devoted to the crop had not exceeded 5,000 acres. The main area of production was the South Burnett and soybeans were grown mainly for food. In the past few years, considerable research has been conducted on soybeans in southern Queensland. Largely as a result of this research, the Darling Downs and West Moreton regions are now the biggest producers of soybeans. The largest production to date for Queensland came from the 1970-71 season when an estimated 8,730 tons were harvested from 12,500 acres." Address: Agronomist, Queensland, Australia.

654. *British Solomon Islands Protectorate, Department of Agriculture, Rice Report (Honiara).* 1971. Soyabeans. 17 p. For the Second Crop 1970. See p. 9-12. *

655. Byth, D.E. 1971. The role of soybean introduction in Australia. In: Proceedings, Sixth Australian Plant Breeding Conference. Perth, Western Australia. *
• ***Summary:*** Introduction of soybean has been active in Australia and well over 1,000 accessions have been obtained since the early 1930s. These varieties were introduced and evaluated by various state and federal agencies, in a largely *ad hoc* way and unsuccessfully in terms of identifying varieties that could be reliably grown commercially.

656. Gerlach, J.C.; Cottier, K.; Cumberland, G.L.B.; Nixon, G.; Bimler, K.; McCormick, S.J. 1971. Studies on the cultivation of soyabean (*Glycine max* (L.) Merrill) in New Zealand. *Proceedings of the Agronomy Society of New Zealand* 1:129-137. [21 ref]*
Address: Field Research Section, New Zealand Dep. of Agriculture, Ruakura Agricultural Research Centre, Hamilton.

657. Lawn, R.J. 1971. Responses of soybean varieties to planting date, population and arrangement in South-East Queensland. M. Agr. Sci. thesis, University of Queensland. *

• ***Summary:*** Soybeans have been actively introduced to Australia, and well over 1,000 accessions have been obtained since the 1930s.

658. **Product Name:** Sanitarium Health Foods Vegelinks (Vegetarian Frankfurter).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1971.
Ingredients: Wheat protein, vegetable oil, yeast, soy protein, salt, Savex, hydrolysed vegetable protein, onion.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. Photo shows a frankfurters on a bed of sauerkraut "Vegetable Protein–Serve fried, boiled, barbecued, roasted or grilled." Recipes for Party Pleasers and Danish Open Omelette.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1971. But note that Worthington Foods introduced a product by this name in 1960, and in 1971 its main ingredient was Fibrotein, spun soy protein fiber.

659. **Product Name:** Sanitarium Health Foods Soya Loaf (Canned Meatless Meatloaf).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: Sydney, N.S.W., Australia.
Date of Introduction: 1971.
Ingredients: Soya beans, wheat protein, soy sauce, vegetable oil, peanuts, tomato, monosodium glutamate, onion, salt, herbs.
Wt/Vol., Packaging, Price: 425 gm can.
How Stored: Shelf stable.
New Product–Documentation: Label. 1980, undated. "Vegetable Protein–Ideal for casseroles, stews, patties." Letter from Sanitarium Health Food Co. 1981.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1971.

660. Food and Agricultural Organization of the United Nations. 1971. Soybeans: Area harvested, yield, and production. *FAO Production Yearbook (Rome, Italy)* 25:229-31.

• ***Summary:*** The following nations are listed for the first time as soybean producers in the *FAO Production Yearbook*. * = Unofficial figure. F = FAO estimate. Peru: Produced 1,000 tonnes (metric tons) in 1961-1965 (yield = 14.6 kg/ha), and 1,000 metric tons in 1967 (yield = 17.2 kg/ha). No production or area statistics are given for Peru for 1968 to 1971, but the yields were: 13.8 kg/ha in 1968, 11.2 kg/ha in 1969, 10.8 kg/ha in 1970, and 11.3F kg/ha in 1971.

Iran: Produced 3,000 metric tons on 5,000* ha in 1967 (Yield: 620 kg/ha), 11,000* tonnes in 1968, 45,000* tonnes in 1969, 47,000F tonnes in 1970, and 50,000F tonnes on 16,000F ha in 1971.

Under Oceania (the first time this term is used): Australia: Harvested 1,000 ha in 1961-1965, 1,000 ha in 1967, 2,000 ha in 1968 and 1969, 4,000 ha in 1970, and 16,000F ha in 1971.

Name changes: Cambodia is changed to Khmer Rep. Congo D. Rep. [Democratic Republic] is changed to Zaire. In 1969 South Rhodesia is changed to Rhodesia. "China, Taiwan" disappears and "China (Main)" is changed to "China P. Rep." [People's Republic].

Other interesting listings: Turkey.

661. *USDA Plant Inventory.* 1971. Plant material introduced January 1 to December 31, 1969 (Nos. 338614 to 346863). No. 177. 278 p.

• ***Summary:*** Soybean introductions: *Glycine max* (L.) Merrill. Leguminosae. 341241-341264 (p. 72). "From Mississippi. Seed grown at Delta Branch Experiment Station, Stoneville. Numbered March 17, 1969." Variety sources and names: Australia via Israel (1); Seminole. Australia via Tanganyika (7); Hernon 237, Red Tanner, Yellow Kedele, Avoyelles, CNS, Sangalo. Australia (1); 16680. Australia via Sudan (1); Congo. Australia via Taiwan (1); Bilofield. Brazil (1); Amerelo Giganti. Sudan (3); CMS, RI 84, HLST. Vietnam (2); E32, Nam Vang.

Tanganyika via El Salvador (6); HLS 154, HLS 167, HLS 219, HLS 239, HLS 241, HLS 263. Liberia Strain. Liberia. Maturity group VI.

Note 1. HLS numbers come from Tanganyika, where the varieties were bred in the early 1960s. The "HLS" designation is probably derived from the names of the parents, Hernon + Light Speckled.

Note 2. The format of this document and the HLS numbers seem to indicate that this "Liberia Strain" came to the USA from Tanganyika via El Salvador. In other words, it started in Liberia, then went to Tanganyika, then to El Salvador, and then to Stoneville, Mississippi. We do not know how it got to Liberia.

Talk with Dr. Randall Nelson, curator of the U.S. Soybean Germplasm Collection, Urbana, Illinois. 1997. Nov. 24. "Liberia Strain" is probably not a varietal name; it just means that this seed probably came from Liberia. We do not know where the variety was before it went to Liberia. Dr. Hartwig, who was the curator of the Southern Soybean Collection in Stoneville, Mississippi at the time, probably received this soybean strain from somebody in Liberia, entered it in the register, then grew it out. There is no additional information about many soybean accessions from the southern collection aside from that which appears in the *USDA Plant Inventory*. Address: Washington, DC.

662. Farmilant, Eunice. 1972. Macrobiotic cooking. New York, NY: New American Library. 224 p. Foreword by Herman Aihara. May. Index. 18 cm. [31 ref]

• ***Summary:*** This pocketbook has a color (beige) photo on the cover of ears of wheat, one wooden spoon filled with soybeans and one filled with unpolished rice. It is "A basic introductory guide to cooking and eating the macrobiotic way." The author's interest in macrobiotics began in April 1968. Basic information on soyfoods (especially miso, tamari, and tofu) is given on pages 29, 33-38, 213-14. Soy-related recipes include: Wheat berries and black beans (i.e. black soybeans, p. 78). Sprouts (incl. soy sprouts, p. 82-83). Miso pickles (p. 124-25). Miso soup (p. 128-29). Cream of miso soup (p. 135). Black beans and wheat berries (p. 139).

There is an entire chapter on miso and tofu (p. 142-46) including: What makes miso so beneficial? Barley miso (nutritional analysis). Miso-vegetable stew. Miso-rice. Miso stew with vegetables. Miso-vegetable spoon bread. Homemade tofu (curded with fresh lemon juice).

Pizza–Macrobiotic style (with miso, p. 149). Chop suey (with tofu and miso, p. 151-52). Miso bechamel sauce (p. 159). Miso gravy. Simple tahini and tamari sauces (p. 160). Tempura dip (with tamari). Simple miso spreads (p. 161). Miso-vegetable spread. Miso-watercress spread.

There is a directory of macrobiotic stores and restaurants in the U.S. (p. 191-203, subdivided alphabetically by state, and within each state alphabetically by city). The following states have the following number of stores and restaurants: Alaska 1, Arizona 4, Arkansas 1, California 32, Colorado 4, Connecticut 18, District of Columbia 3, Florida 14, Georgia 7, Hawaii 2, Illinois 7, Indiana 2, Iowa 5, Louisiana 4, Maine 14, Maryland 7, Massachusetts 51, Michigan 12, Minnesota 3, Mississippi 2, Missouri 3, Nevada 1, New Hampshire 20, New Jersey 9, New Mexico 3, New York 61, North Carolina 5, Ohio 14, Oklahoma 3, Oregon 2, Pennsylvania 8, Rhode Island 5, South Carolina 1, Texas 4, Utah 1, Vermont 26, Virginia 4, Washington 3, Wisconsin 2.

There is also a directory of stores, restaurants, and centers outside the U.S. (p. 204-07, subdivided by country). The following countries have the following number of stores, restaurants, or centers: Australia 1, Belgium 2, Brazil 2, Canada 15, Denmark 4, France 29, Germany 1, Holland (Netherlands) 2, India 1, Italy 1, Japan 3, Portugal 1, Puerto Rico 1, Spain 1, Sweden 1, Switzerland 2, United Kingdom: England 13, Scotland 1, Vietnam 2.

A list of wholesale distributors in the U.S. (p. 208-09) includes Shiloh Farms (Route 59, Sulfur Springs, Arkansas), Erewhon Trading Co. (8003 W. Beverly Blvd., Los Angeles, California 90048), Chico San Foods (1262 Humboldt Ave., Chico, California 95926), Erewhon Trading Co. (33 Farnsworth St., Boston, Massachusetts 02210), Deer Valley Farms (Guilford, New York 13780), Infinity Food Co. (171 Duane, New York, NY 10013), Mottel Foods (451 Washington, New York, NY 10013), Juniper Farms (Box 100, Sugar Loaf, NY 10981), Pioneer Specialty Foods (Fargo, North Dakota 58100), Merit Food Co. (Pill Hill Lane, Box 177, Bally, Pennsylvania 19503), Essene (58th & Grays Ave., Philadelphia, PA 19143).

663. Rutledge, David J.S. 1972. Hedgers' demand for futures contracts: A theoretical framework with applications to the United States soybean complex. *Food Research Institute Studies in Agricultural Economics, Trade, and Development (Stanford Univ.)* 11(3):235-56. June. [21 ref]

• ***Summary:*** Discusses the behavior of hedgers in commodity futures markets, with special attention given to the way in which hedgers make decisions as to the size of their holdings of future contracts. The author's review of the literature on commodity futures markets revealed two views of hedging which appear to conflict quite sharply. He defines these two. Address: Lecturer, School of Economic and Financial Studies, Macquarie Univ., North Ryde, Australia.

664. Australia and New Zealand Banking Group, Economics Dept. 1972. Soybeans in Australia. Melbourne: A.N.Z. Banking Group. 21 p. Tables. 34 cm. * Address: Melbourne, Australia.

665. Carter, O.G. 1972. Soybean research. Dept. of Agronomy, University of Sydney, Australia. 60 p. Summarized in Soybean Digest, Jan. 1972, p. 28. *

666. Laing, D.R.; Byth, D.E. 1972. Soybeans in Australia–Crop review. In: Proceedings of the Specialist Conference on Crops of Potential Economic Importance, Sydney / Manly, NSW. 2 vols. Illust. *

• ***Summary:*** Expansion of soybean production in the near future in Australia will probably occur mainly in irrigated areas. Current production areas are largely between 26ºS and 33ºS latitude, and most of the anticipated growth in the near future is expected to take place in this region.

667. MacFarlane, R. 1972. Rice report (rice, soya beans and lima beans). Second crop 1971, Annual Report. Solomon Islands: Honiara, British, Department of Agriculture. 12 p. * Address: British Solomon Islands Dep. of Agriculture.

668. **Product Name:** Sanitarium Health Foods Soya Beans Natural (In Brine).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: Sydney, N.S.W., Australia.
Date of Introduction: 1972.

Ingredients: Soya beans, salt.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Label. 1980, undated. "A delicious protein-rich vegetable." Two recipes on label. Letter from Sanitarium Health Food Co. 1981.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1972.

669. Stapley, J.H. 1972. Principal pests of crops in the Solomon Islands. *Past Articles and News Summaries* 18(2):192-96. *

670. Carr, D.J. ed. 1972. Plant growth substances 1970. Proceedings of the 7th International Conference on plant growth substances held in Canberra, Australia. December 7-11, 1970. Berlin: Springer-Verlag. 837 p. *
Address: Research School of Biological Sciences, Australian National Univ., Canberra, Australian Capital Territory.

671. Haddon, Joan. 1972. The Australian book of health food cookery. Sydney, Australia, London, England: Collins. 140 p. Color plates. 21 cm. (Fontana Books).
• ***Summary:*** A vegetarian cookbook. Soy-related recipes include: Soy vegetable soup (with whole soybeans, p. 29). One chapter titled "Soy Bean Dishes" (p. 60-63) contains the following recipes: Soy bean loaf. Japanese soy bean croquettes (with canned soy beans and soy bean flour). Soy bean stuffed tomatoes (with canned soy beans). Baked soy beans. Soy bean rissoles. Soy bean baked omelette.
Address: Australia.

672. Quick, Graeme Ross. 1972. Analysis of the combine header and design for the reduction of gathering loss in soybeans. PhD thesis, Iowa State University, Ames, Iowa. v + 282 p. Illust. No index. Page 163 in volume 33/01-B of Dissertation Abstracts International. [83 ref]
• ***Summary:*** Contents: List of symbols and abbreviations. 1. Introduction. 2. Research objectives. 3. Review of the literature: Historical perspectives, header performance in cereal grains, "open vs. closed fronts" in cereals, header performance in some other crops (rice, sorghum, small seeds), soybeans and combine header performance, modified headers and attachments for soybeans, summary. 4. The Soybean crop: Soybean production and usage, economic of header loss to the farmer, selection of suitable varieties, row spacing and plant population, timeliness of harvest, crop physico-chemical characteristics, mechanically-induced shatter. 5. Experimental procedures for evaluating the header. 6. Characteristics of the standard header. 7. Header component analysis, evaluation and re-design. 8. Cutterbars. 9. Summary. 10. Conclusions. 11. Recommendations for further study. 12. Acknowledgements. 13. Bibliography. 14. Appendix.

Introduction: "The modern combine harvester (called a "header" in Australia) is the most complicated and expensive piece of equipment used on most farms. It is probably also the least used. In order to increase combine use and justify the expense of ownership, manufacturers have favored a universal design approach; they produce a standard model which will perform reasonably well, with only minor modifications, in a wide variety of crops and field conditions. The adaptation of the corn head as an attachment for the standard combine in 1954, for example, has increased combine harvest acreage in the U.S. over 20 percent."

Combine losses fall into two categories: (1) Gather or header loss, and (2) Through-combine loss (threshing, separating and cleaning, body leakage). Header losses have been given relatively little attention, but the header is the "capacity limiting component of the machine when harvesting soybeans."

"Soybean yields have been rising consistently, from 11.0 bu/acre when the first combine was driven into a soybean field in 1924 by the Garwood Brothers in Illinois, to a national average of 27.3 bu/acre in 1970. The combine made possible the initial upsurge in production of soybeans for seed; prior to this the crop had been grown primarily for forage and fertilizer." An illustration (p. 3) shows the essential parts of a standard header, with pickup reel, reciprocating cutterbar with 3 inch guard spacing, and an auger platform.

Near the beginning of the Review of the Literature section, the author states: "Seeds and grains constitute 67 percent of man's diet. To use these commodities as food for animals doomed for slaughter and to decrease thereby the effective food supply to one tenth of what it would have been by direct consumption needs to be more seriously challenged in this age of environmental awareness. Society can be enlightened to the nutritional advantages of the vegetarian diet."

In North America the combine was developed and evolved for harvesting cereal grains on the West Coast. Many decades passed before it was first used in 1924 to harvest soybeans in the Midwest. By 1927 it had made considerable inroads, largely due to the need to harvest soybeans more efficiently than was possible with the standard mower, binder, and thresher teams.

By 1928 Heitshu had alluded to the design of a floating cutterbar. In 1931 the first patent on a pickup reel was filed. In 1949 the first recorded work on header height controls was published. Then during the 1950s, following the decline in use of the draper conveyor, the reel-auger-cutterbar header design became universally established (p. 6).

"It is unlikely that much credit can be given to combine designers for the steady increase in soybean yields. In fact, it might be concluded that the breeding of more shatter- and lodging-resistant varieties has probably been offset by the tendency of the operator to make fuller use of the increasing power of the combine, and thereby increase his losses by operating at higher forward speeds. As the forward speed increases, average stubble length increases; furthermore, header loss increases with header width" (Lamp et al. 1962; p. 20).

The first survey of soybean harvesting losses was undertaken in 1927. But a review of subsequent surveys showed that harvesting losses still averaged 9% of total yield in the U.S. and had not markedly declined since loss measurement began. He developed a quantitative shatter index for soybeans.

A table (p. 21) summarizes the results of 15 investigation conducted from 1926 to 1970 on soybean header losses (standard headers only). For each study is given: Year of study, investigators/reference, state, magnitude of header loss and range, header loss as a percentage of total losses, and comments (such as type of combine, number of locations, yield, etc.).

Note: This is the earliest document seen (Sept. 2005) that uses the term "pickup reel" or "reciprocating cutterbar" in connection with soybean production. Address: Iowa State Univ., Ames, Iowa.

673. Quick, Graeme Ross. 1972. Historical perspective (Document part). In: G.R. Quick. 1972. Analysis of the Combine Header and Design for the Reduction of Gathering Loss in Soybeans. PhD thesis, Iowa State University, Ames. Iowa. 282 p. See p. 6-13. [83 ref]

• ***Summary:*** Patrick Bell in England (1826), and the McCormicks (1816-1850s; Cyrus Hall McCormick, lived 1809-1884 was an American inventor) and Hiram Moore (1838) in the U.S. developed and used cutting reapers. Shortly thereafter (in 1842) Australian inventors initiated the development of the "header-stripper" for standing cereal crops.

"The American horse-drawn machines probably evolved out of Cyrus Hall McCormick's 1831 reaper. They employed a cutterbar reciprocating through guards, conveying canvas and the bat reel. The first successful Australian machine, John Ridley's, used a stripping comb over which revolved a set of beaters to knock off" the heads, thresh them, and "deliver them to a box. There was no knife and the full straw was left standing."

"A 22-foot wide platform, side-fed harvester, with a steam engine replacing the horse team, was probably the first self-propelled machine. This was built by Wm. Berry in California in 1887 and was capable of harvesting 50 acres of wheat in a day. By 1893, Benjamin Holt had built and operated a 50-foot cut combine in California (Nyberg 1957). Daniel Best of San Leandro was credited with having built the first combine which replaced ground wheel drive power with an auxiliary steam engine drive (Caterpillar Tractor Co. 1954). The need for traction and flotation for these enormous combine harvesters led to the development of the first successful crawler track. Best and Holt later merged their interests to form the Caterpillar Tractor Company in 1925."

In Australia, by 1884, Hugh Victor McKay had added a winnower cleaning section to the basic Ridley-type, and in 1909 McKay built a 24-foot self-propelled stripper-harvester with an internal combustion engine side-mounted on the chassis. A market was growing for the stripper-harvesters made at McKay's "Sunshine" factory and, between 1895 and World War I, the company even exported 10,000 of its machines. This huge volume of exports caused North American harvester manufacturers to take note, and one result was that in 1901 Massey-Harris of Toronto, Ontario, Canada, began production of stripper-harvesters, followed in 1904 by International Harvester Co. of Chicago. Neither company sold these machines on their domestic markets (Baker 1961).

The Australian-born "stripper-harvester revolutionized the harvest operation by combining the gathering and threshing operations into one machine, but the [Ridley-type] stripper-beater, with its knifeless long tooth comb had severe limitations in wet or down and tangled crops. Grain loss was also high in sparse crops. The challenge to produce a machine in Australia which could cope with these conditions was partially met by some farmers in New South Wales. They worked with Massey-Harris representatives, and adopted the knife into their 'reaper-thresher' (Wheelhouse 1966). By 1910 the Canadian firm was manufacturing this long tooth combed machine specifically for export to Australia. It was another New South Welshman, Headlie S. Taylor, who finally overcame the problem of harvest lodging with the long toothed comb, after several years of development of his header-harvester. He installed augurs over the comb. This development attracted the interest of machinery manufacturer, H.V. McKay, who became impressed with the possibilities. McKay bought the manufacturing rights and then employed Taylor to work at the Sunshine factory in Victoria. In 1920, after a wet season in the Eastern Australian wheatbelt, the Sunshine header had won a wide reputation." Five reasons are given for the success of the twin-augur-header over the stripper-harvester.

"In 1924 Taylor produced the first Sun Auto-Header, a 12-foot self-propelled combine 'with the comb front forming the widest part of the machine.' The Tee-shaped combine configuration had arrived! This concept was patented and no other make of self-propelled combine with full-width header was commercially released until the patent expired 17 years later. In 1938 a Sun Auto-Header harvested 3,300 bu of wheat in one day–a record that was unsurpassed during the next 33 years.

The pioneering research on combine design and manufacture in far-away Australia, conducted between the 1880s and 1924, was about to have a major and direct effect (via Canada!) on soybeans in America.

"Elmer J. Baker, 'the Reflector,' of *Farm Implement News* fame (later Implement and Tractor Magazine), was to be instrumental in directing the Massey-Harris Company to deliver a combine for soybean harvesting to a subscriber in Illinois. The subscriber was an International Harvester dealer who was disgruntled because his company refused to ship him a combine for sale to the Garwood Brothers–clients who were growing soybeans near Stonington, Illinois. There is no record of a combine having been tested in any crop in Illinois to that date, 1924. The Reflector referred his reader to Massey-Harris at Toronto, with full knowledge that they had no sales facilities in the U.S. What followed is history." Baker wrote about what happened in the 20 Nov. 1924 issue of *Farm Implement News* (which see).

"The success of the combine in the Illinois soybeans was followed by intensive breeding trials for the Garwood farms. The increase in plant size and yield led to a preference for the wide cylinder type combine. Several other harvesters were developed concomitantly for soybeans, but none could even approach the efficiency of the combine header (Sjogren 1939). No other method succeeded as well. The American self-propelled and pull-type combines of this era continued to use the draper-conveyor and side feeding.

"The 'straight-through' or 'scoop' design, with full-width threshing cylinder, made its appearance around 1935 and in 1938 Massey-Harris released the first self-propelled version, the 'Clipper' (Massey-Ferguson Inc., 1964). In 1939, coincident with the expiration of Taylor's patent, Massey-Harris offered the Model 21 combine of Tee-configuration" which now competed with McKay's Auto-Header made in Australia.

"Possibly the first U.S. combine to employ the auger was Curtis Baldwin's 'Gleaner.' Baldwin's earliest machines anticipated the 'Unisystem' approach to farm machinery design, whereby the same power system is used for a variety of field machines. Baldwin mounted his machine on a Fordson tractor in 1923. His concept of mounting the threshing-cylinder on the header still lingers in the modern 'down-front' Allis-Chalmers combines. All U.S. combines now utilize the auger conveyor for header cross-feeding."

"Combine sales did not increase significantly until World War II when wartime shortages of manpower and grain spotlighted the need for more efficient harvesting. Today an estimated 3 million combines are in use throughout the world.

"The present day version is more versatile than ever–the same machine can harvest a 5000-fold range of seed sizes–but it is also more complicated, containing an estimated 35,000 parts in one machine. It is more efficient, but it is more expensive than ever."

An illustration (p. 7) shows landmarks in the history of the harvester and header. Address: Iowa State Univ., Ames, Iowa.

674. *Territory of Papua and New Guinea, Department of Agriculture, Stock and Fisheries. Annual Report (Port Moresby).*1972. Division of Research and Surveys. p. 27-204. For the year 1967-69. See p. 73-74, 141.
• ***Summary:*** A paragraph titled "Soybean" (p. 73-74) states that two formal trials were conducted. At Aiyura, a soybean variety x spacing trial was planted in Oct. 1967 to test five of the most promising varieties: NG4662, Avoyelles, Coral Sea, Mission, and SHE 30. The results were inconclusive. At Goroka a spacing trial was planted in Oct. 1967 using only one variety (NG4662). Overall yield was very good at about 1 ton per acre. Conclusion: Plants should be spaced no closer than 8 by 4 inches. The section on "Plant introduction and quarantine" contains a table (p. 119) showing that, among the oil crops, 4 soybean varieties were introduced during 1967-69.

675. Lawn, R.J.; Byth, D.E. 1973. Response of soya beans to planting date in South-Eastern Queensland. I. Influence of photoperiod and temperature on phasic developmental patterns. *Australian J. of Agricultural Research* 24(1):67-80. Jan. [14 ref]
• ***Summary:*** "In recent years considerable interest has developed in the soya bean as an alternative crop for many agricultural areas in eastern Australia." Eighteen cultivars from Morocco, USA, Tanzania, and Nigeria, plus local selections were tested. Table 1, titled "Cultivar information, gives the name of each variety, the relative maturity (very early, early, mid season, late, etc.), the flowering type (all but two are determinate), and the country of origin. Named varieties include Hill, Dorman, Lee, Ogden, Bragg, Wills, Hampton, Semstar, Avoyelles, Hernon, Ross, Gilbert, Daintree, and Mamloxi.

"Phenological development of a range of soya bean cultivars for a series of planting dates was studied at Redland Bay, Queensland." The duration of the different phases of development were related to the day length and temperature pattern during each phase. Varieties differed markedly in their sensitivity to photoperiod. Temperature had a significant influence only on those least sensitive to photoperiod. Address: 1. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067; present address: Dep. of Agronomy, Univ. of Minnesota, Minneapolis; 2. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067.

676. Pritchard, A.J.; Byth, D.E.; Bray, R.A. 1973. Genetic variability and the application of selection indices for yield

improvement in two soya bean populations. *Australian J. of Agricultural Research* 24(1):81-89. Jan. [22 ref]

• ***Summary:*** "Soya bean culture is based almost entirely on American introductions, or on local selections from them." "Significant genetic variability was found in two hybrid soya bean populations and progress in yield through selection was demonstrated." Address: 1&3. Div. of Tropical Pastures, CSIRO, Cunningham Lab., St. Lucia, Qld. 4067, Australia; 2. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067.

677. *Business Week*. 1973. Dwayne Andreas' affair with the soybean. June 2. p. 54.

• ***Summary:*** Andreas has great interest in and hopes for TVP, though it presently accounts for only a tiny fraction of ADM's total sales. "Andreas believes its potential as a food extender and meat substitute in the U.S. could lead to sales of 2.7 billion pounds by 1980. Now ADM has an estimated 60% of the business, with the rest produced under license. Talks are also under way for ADM to construct TVP plants in Brazil and Yugoslavia, an ADM TVP plant is under construction in Great Britain and one is in the planning stages in Australia.

"The 55-year-old Andreas seems the very antithesis of an entrepreneur... His father, Reuben P. Andreas, was farming at Lisbon, Iowa, near Cedar Rapids, when he took over a bankrupt country elevator during the Depression and ran it as a family enterprise with his four sons. Honeymead Products Co. [sic, R.P. Andreas & Son], as it was called, bought processed soy meal until 1938, when the 20-year-old Dwayne persuaded his father to buy the machinery to process its own. Honeymead built the plant in Cedar Rapids.

"In 1945, the Andreases sold the family-owned business to another private company, the giant Cargill, Inc., in Minneapolis [Minnesota]. For seven years Andreas ran Cargill's soybean business.

"In 1952, he left Cargill and again set up Honeymead [in Mankato, Minnesota], which promptly reentered the soybean business in competition with his former employer. Andreas and his brothers, Lowell, Albert and Glenn, sold Honeymead to the Grain Terminal Association, which operated the soybean business of Farmers Union, a large farmer-owned co-operative...

"In 1966, Minneapolitans were startled to learn that he had bought an interest in Archer Daniels Midland, an old-line family-controlled grain company. With a foothold in ADM, which Andreas says he was 'invited' to take by the Archer family, Andreas began buying ADM stock on the open market. Andreas was invited to sit on the board, and became chairman of the executive committee in 1968. 'I knew that ADM was a dozen years ahead of everyone else in textured vegetable protein research, and I believed that was where the important action was going to be,' Andreas recalls. 'One of the first things I did was to take the edible soy out of the lab and construct a plant in Decatur to make all the grades of edible soy protein in 1969. When we first built it, we thought we had the capacity to make all the product we could sell through 1976. We have already doubled production, and are short.'"

A photo shows Dwayne Andreas.

678. Dean, M.E. 1973. A study of normal infants fed a soya protein isolate formula. *Medical J. of Australia* 1(26):1289-93. June 30. [8 ref]

• ***Summary:*** A powdered soy formula (Similac-Isomil) when fed for 6 months to healthy, full-term infants, gave good growth. "The soya bean isolate formula appears to be an adequate nutritional source for normal Australian babies and compares at least as well as one of the most commonly used infant feeding formulæ in this country. The newer soya bean isolate appears to have none of the disadvantages previously associated with soya bean formulæ, apart from some perianal irritation in the first two weeks of life." This study was supported by Ross Laboratories. Address: Dep. of Pediatrics, Adelaide Children's Hospital, North Adelaide, SA 5006, Australia.

679. Agriculture Branch Officers. 1973. Soybean varieties for 1973-74. *Queensland Agricultural Journal* 99(11):597-98. Nov.

• ***Summary:*** "Soybean is a crop that has been expanding rapidly in Queensland in recent years. A further large increase in the planted area is expected in the 1973-74 season as a result of the recent price increase offered by processors." December is the main month for planting soybeans.

A long table has the following columns: District, planting time, varieties, and planting rates (plants/ha). The 12 districts are: Far North, Burdekin, Central Coast Region, Central Highlands, Callide-Dawson, Burnett Region (Sub Coastal, Central Area), Near North Coast, West Moreton, Darling Downs (Northern Downs, Central Downs, Southern Downs), Granite Belt, Border Region, St. George. Within each district are specific towns, and in some cases, sub districts, and sub-sub districts (as in Burnett Region and Darling Downs). The varieties are listed in four ways: Regular, irrigated, rain-grown, and for trial. These varieties (listed here alphabetically) are: Bragg, Daintree, Davis, Hampton, Hill, Improved Pelican, Ross, Semstar, and Wills. Address: Dep. of Primary Industries, Queensland, Australia.

680. Williamson, A.J.P.; Rose, J.L. 1973. Soybean variety trial results. *Queensland Agricultural Journal* 99(12):662-64. Dec.

• ***Summary:*** "Queensland's soybean research programme has been intensified and expanded steadily in the last 6 years. The variety testing programme identified varieties that showed promise for economic commercial production.

"A large scale regional variety testing programme was initiated during the 1971-72 season and trials were conducted at 20 sites throughout Queensland." The varieties Davis and Bragg excelled in all parts of Queensland. Address: Agriculture Branch, Dep. of Primary Industries, Brisbane, Australia.

681. Cox, Christopher Barry; Healey, I.A.; Moore, P.D. 1973. Biogeography: An ecological and evolutionary approach. New York, NY: John Wiley & Sons. viii + 184 p.
• ***Summary:*** Chapter 6 (p. 109-28) discusses "The Distant Past," including the geologic time scale and continental drift. The idea of continental drift gave birth to the field of biogeography. "Several scientists in the early years of the 20th century had noticed the great similarity between the outlines of the continents on either side of the Atlantic, and had suggested that they had once been joined and later moved apart. In 1910 the American geologist F.B. Taylor, for example, suggested that movements of this kind might have been responsible for the formation of the major mountain ranges of the world." The German scientist Alfred Wegener (who was primarily a meteorologist and astronomer) had made similar observations but in the autumn of 1911 he found firm evidence in the literature of palaeontology and geology of this connection. Wegener's theory, first published in 1915, demanded radical changes in the beliefs of geologists, and was slow to catch on. Only since about 1953, when a variety of new lines of evidence emerged, have Wegener's ideas gradually become accepted. One of these new lines was paleomagnetism, the study of the direction of magnetization of rocks. Originally there was a land mass named Pangaea. It split into two connected supercontinents, Laurasia and Gondwanaland. About 70 million years ago they split into continents that began to drift apart at the rate of 5-10 cm/year. The collision of India with Asia threw up the Himalayan Mountains. The largest land vertebrate ever known was the herbivorous dinosaur *Brachiosaurus*, which weighed close to 75 tons. It had an air hole in the top of its head to breathe while standing in water.

Chapter 7, titled "The Shaping of Today," discusses how continental drift influenced the flora, fauna, and climate of today's world. In the 70 million years between the Lower Cretaceous (about 120 million years ago) and the Eocene (about 50 million years ago), the world changed from a single land-mass dominated by gymnosperms and reptiles to a pattern of separating continents dominated by flowering plants and mammals. Because the rise of the flowering plants took place in the early Cretaceous, before that of the mammals in the Paleocene, the effects of continental drift upon the distributions of these two groups were rather different.

"Continental drift facilitated the development of separate, distinctive faunas and floras, not merely because of the physical separation of the new continents by ocean barriers, but in other ways also. The climates of land areas newly bordered by seas became milder and less variable."

Concerning the rise of flowering plants: Perhaps the most basic fact about the distribution of flowering plants, or angiosperms, is that almost everywhere in the world, four families are among the six most numerous–the Compositae, Graminae (grains), Leguminosae (legumes) and Cyperaceae. "Similarly, dicotyledonous angiosperms are almost everywhere more abundant and diverse than the monocotyledonous types." The Australian Floral Region is unique and distinct from those around it. "The Australian flora appears as an intrusive element in an otherwise uniform southern Pacific flora." A host of facts "clearly suggest that angiosperms spread through the world at a time when the continents had not yet split apart, so that a flora of fairly uniform composition (at family level) spread everywhere." It is clearly possible that angiosperms spread throughout the supercontinent of Gondwanaland before its breakup during the Cretaceous (65 to 136 million years ago).

Mammals supplanted reptiles during this process. "Though the earliest mammals appeared in the Triassic [190 to 225 million years ago], long before the earliest angiosperms, it was not until the late Cretaceous [about 65 million years ago] that they became more varied, while their differentiation into the many orders seen today took place only after the extinction of the dinosaurs at the very end of the Cretaceous [about 65 million years ago]." Marsupials may have been the earliest mammals, before placentals. Australia still has a rich diversity of marsupials.

Note: All of this relates to the mystery of how wild soybeans and wild perennial Glycine species (relatives of the soybean) arrived in Australia and are now found there in such abundance and diversity. Address: School of Biological Sciences, King's College, London.

682. Food and Agricultural Organization of the United Nations. 1973. Soybeans: Area harvested, yield, and production. *FAO Production Yearbook (Rome, Italy)* 27:130.
• ***Summary:*** The following nations are listed for the first time as soybean producers in the *FAO Production Yearbook.* * = Unofficial figure. F = FAO estimate. Bolivia: Harvested 1,000 ha in 1971 and 1972, and 2,000* ha in 1973.

Guyana: Harvested 1,000 ha in 1971*, 1972*, and 1973F. Mal W Malays [Malaysia and West Malaysia]: Achieved yields of 1,417 kg/ha in 1961-65, 1,607 kg/ha in 1971, and 1,500 kg/ha in 1972.

Spain: Harvested 2,000 ha in 1971 and 1972, and 13,000 ha in 1973.

British Solomons [British Solomon Islands Protectorate]: Achieved yields of 1,000 kg/ha in 1961-65, 1971, 1972, and 1973.

683. George Ohsawa Macrobiotic Foundation. 1973. Useful names and addresses. 1471–10th Ave., San Francisco, CA 94122. 55 p. 21 cm.
• ***Summary:*** This macrobiotic directory lists names and addresses of macrobiotic people, organizations, food stores and restaurants, and bookstores in the United States (each category broken down by state), Canada, and abroad. The leading states for individuals are California (7.3 pages), New York (1.5 p.), and Massachusetts (1 p.).

There are listings for the following foreign countries: Argentina, Australia, Austria, Belgium, Brazil, Costa Rica, Denmark, England, France, Germany, India, Ireland, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, South Vietnam.

There are ads for the following companies: Sunflower, The Queensberry Bakery (112 Queensberry St., Boston 02215), East West Foundation Center, Sanae Inc. at 2 locations (Sanae Restaurant at 272A Newbury St., Boston, and The Seventh Inn at 288 Boylston St. in Boston), Prasad (1956 University Ave., Berkeley, California) (p. 0). Eden whole earth grocery and delicatessen, and Sun Bakery (330 Maynard St., Ann Arbor, Michigan) (p. 18). Janus Natural Foods (712 7th Ave. South, Seattle, Washington 98104. Phone: 206-MA4-1084) shows that they distribute (import) tamari and miso, as well as sea vegetables. They carry the following brands: Erewhon, Spiral Foods, Deaf Smith, Pure & Simple, Chico-San, Arrowhead Mills (p. 27). Cliffrose (129 Coffman, Longmont, Colorado). Ceres Harvest Natural Foods (3632 W. Colorado Ave., Colorado Springs, CO 80904; wholesale and retail) (p. 39). The Good Karma Cafe (501 Dolores St., San Francisco), and The Good Earth (123 Bolinas Rd., Fairfax, CA 94930) (p. 50). Greenberg's Natural Foods, Inc. (125 1st Ave., New York, NY 10003).

The George Ohsawa Macrobiotic Foundation is a non-profit organization located at 1471–10th Ave., San Francisco, California 94122. It was founded in 1971. The aim of the Foundation is to spread the teaching of the unifying principle and its practical applications in daily life. Address: San Francisco, California.

684. Muntgomery, V.E.; Shorter, R.; Byth, D.E. 1974. Genotype x environment interactions and environmental adaptation. I. Pattern analysis–Application to soya bean populations. *Australian J. of Agricultural Research* 25(1):59-72. Jan. [38 ref]
• ***Summary:*** Interactions between a genotype and its environment serve to confuse comparisons between lines in most field situations. The importance of this has been recognized for several decades, so testing in various environments is now a common practice. Address: 1. Queensland Dep. of Primary Industries, Biloela, Qld. 4715, Australia; 2. Dep. of Agronomy, Iowa State Univ., Ames, Iowa; 3. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld 4067, Australia.

685. Lawn, R.J.; Brun, William A. 1974. Symbiotic nitrogen fixation in soybeans. I. Effect of photosynthetic source-sink manipulations. *Crop Science* 14(1):11-16. Jan/Feb. [19 ref]
• ***Summary:*** Symbiotic nitrogen fixation in the varieties tested declined during podfilling as the result of inadequate assimilate to the nodules. Address: Dep. of Agronomy and Plant Genetics, Univ. of Minnesota, St. Paul, MN 55101. Brun is now Research Scientist, Div. of Tropical Agronomy, CSIRO, Brisbane, Australia.

686. Lawn, R.J.; Brun, William A. 1974. Symbiotic nitrogen fixation in soybeans. III. Effect of supplemental nitrogen and intervarietal grafting. *Crop Science* 14(1):22-25. Jan/Feb. [12 ref]
• ***Summary:*** Soybeans fail to respond to nitrogen fertilizer like non-leguminous crops do. "In general, nodule initiation, development, and nitrogen-fixing activity are all inhibited by increasing availability of inorganic nitrogen [fertilizer]... Thus the addition of nitrogen to the soil tends to substitute for, rather than supplement, symbiotic [nitrogen] fixation." Address: Dep. of Agronomy and Plant Genetics, Univ. of Minnesota, St. Paul, MN 55101. Brun is now Research Scientist, Div. of Tropical Agronomy, CSIRO, Brisbane, Australia.

687. Lawn, R.J.; Fischer, K.S.; Brun, William A. 1974. Symbiotic nitrogen fixation in soybeans. II. Interrelationship between carbon and nitrogen assimilation. *Crop Science* 14(1):17-22. Jan/Feb. [9 ref]
• ***Summary:*** Total nodule activity (TNA) is affected by the physiological stage of development of the plant. Fresh nodule weight per plant and specific nodule activity (SNA) increased during the pre-flower and flowering stages of development, but SNA (and consequently TNA) decreased significantly during pod-filling. Address: Dep. of Agronomy and Plant Genetics, Univ. of Minnesota, St. Paul, MN 55101. Brun is now Research Scientist, Div. of Tropical Agronomy, CSIRO, Brisbane, Australia.

688. Kimber, A.J. 1974. Crop rotations, legumes and more productive arable farming in the highlands of Papua New Guinea. *Science in New Guinea* 2(1):70-79. April. [2 ref]
• ***Summary:*** Discusses the results of trials from Nov. 1955 to Nov. 1967 comparing (a) short crop rotations in which the land was cropped continuously with annual crops (sweet potato / sorghum / soyabean or groundnuts) with (b) long rotations.

Soybean was included only in rotation 3, a short rotation with three annual crops: Sweet potatoes, sorghum, and soybeans. Soybean yields (in kg/ha of unshelled pods) were 428 in the first cycle, 1,588 in the second, and 1,719 in the third. Conclusions: Short rotations are the generally most profitable for farmers. It is necessary to diversify arable farming in the Highlands, especially by including legumes in the rotation. "Two of the most likely candidates are peanut and soybean..." Note: It would appear that the soybeans in rotation 3 were first planted in 1956.

Legumes are found in many parts of the country. In the Highlands, large areas are planted to winged bean (*Psophocarpus tetragonolobus*) and peanuts rotated with sweet potatoes.

Note: This is the earliest document seen (July 2007) that clearly refers to soybeans in Papua New Guinea, or the cultivation of soybeans in Papua New Guinea (1956). Address: D.A.S.F., Highlands Agric. Exp. Station, Aiyura, Papua New Guinea.

689. *Soybean Digest.* 1974. Processing plant in Australia. April. p. 34.

• ***Summary:*** "Archer Daniels Midland Co. of Illinois is building a soybean processing plant in Australia in conjunction with the Australian company, Provincial Traders. The first of its kind in Australia, the plant, slated to begin production in April 1974 is sited at Toowoomba in Queensland. The district around Toowoomba, known as the Darling Downs, produces the bulk of Australia's soybean crop. The new plant will initially handle 250 tons of seed per day, and will step up to 750 tons/day when more soybeans become available."

690. Sumbak, J.H. 1974. Research experience with soy beans (Glycine max) in P.N.G. [Papua New Guinea] with special reference to the Markham Valley. *Science in New Guinea* 2(1):80-84. April. [Eng]

• ***Summary:*** "Soyabeans have been grown in many parts of Papua New Guinea for years. There has been little commercial cultivation (aside from one venture near Kainantu in 1973) to date, however. The Department has carried out variety work at Aiyura for some years now and has selected a number of varieties which appear to do fairly well under Highland conditions... Since 1972 trials have been carried out in the Markham Valley on a fairly intensive basis."

In a formal trial harvested in June 1972 at Markham Farming in the Markham Valley, three varieties gave good yields: NG 6442 yielded 1,210 lb/acre; NG 4661 yielded 1,180 lb/acre; and Avoyelles yielded 1,070 lb/acre. The lowest yields cane from Mission, only 430 lb/acre. Address: D.A.S.F., Bubia Agric. Exp. Station, Papua New Guinea.

691. Whigham, D.K. 1974. International variety trials. *INTSOY Series* No. 2. p. 20-37. Proceedings of the Workshop on Soybeans for Tropical and Subtropical Conditions (College of Agric., Univ. of Illinois at Urbana-Champaign). [Eng; spa]

• ***Summary:*** "The INTSOY variety evaluation trials were established in early 1973 to determine the adaptability of soybeans throughout the tropical and subtropical areas of the world. Commercially available soybean varieties were used because of the quantity of seed required. Large quantities of experimental lines were not available."

In 1973, soybean trials were conducted in 33 different countries. In 11 of these countries, FAO cooperated in the trials. The 1973 trials consisted of 20 varieties which were replicated four times in a randomized complete block design. Table I titled "1973 INTSOY variety evaluation trials" (p. 22) lists the names of the 33 cooperating countries and the number of variety trials conducted by each country during 1973. A total of 90 trials (the number for each country is shown after the country name) were conducted during the year. An asterisk (*) shows the 11 countries in which FAO cooperated. Africa: Egypt* 1, Ethiopia* 3, Ghana 3, Kenya 1, Sierra Leone 2, Somalia* 2, South Yemen* 1, Sudan* 1, Tanzania 3.

In Somalia, the two soybean trials in 1973 were conducted by: Mr. M.A. Dukseyeh, Head, Agricultural Research Service, Ministry of Agriculture, Central Agricultural Research Station–Afgoi, Mogadishu, Somalia. Note: These are the first soybean trials conducted in Somalia since 1927 (see Vivenza 1928).

Asia: Afghanistan* 1, India 2, Indonesia 5, Malaysia 2, Pakistan* 3, Philippines 3, South Viet Nam 3, Sri Lanka 12, Taiwan 2, Thailand 7, Tonga 2.

Mesoamerica: Belize 3, Costa Rica 4, Guatemala 2, Mexico 3, Nicaragua 1, Puerto Rico 6.

Middle East: Iran* 1, Iraq* 1, Jordan* 2, Syria 1.

South America: Colombia 3, Ecuador 2, Peru 2.

Specific results for all varieties tested are given for Sri Lanka (4 sites), Philippines (2 sites), Puerto Rico (2 sites), Pakistan, and Indonesia. At most locations the protein and oil content was greater than when the same varieties were grown in the USA.

A comparison of the Appendix of this report (p. 33-37, unnumbered) with the "International soybean variety experiment: First report of results" (Whigham, Oct. 1975. INTSOY Series No. 8) shows that cooperators in six countries who were sent soybeans for trials did not send back any results: They were: (1) South Yemen–Dr. H. Idris, Agricultural Research Station, El Kod, Aden, South Democratic Yemen. Note: This is the earliest document seen (Dec. 2007) concerning soybeans in Yemen. (2) Sudan–Dr. M.O.M. Salih, Director of Agric. Research Corp., Wad Medani, Sudan; (3) Tonga–Mr. Merle M. Anders, Agronomist, Dep. of Agriculture, Box 14, Nuku'alofa, Tonga. Note, however, that Mr. Anders reported his results in 1976 in the *Fiji Agricultural Journal* 38(2):77-80.

Note: This is the earliest document seen (March 2010) concerning soybeans in Tonga; they arrived there in 1973 and were planted by Anders on 27 June 1973 (See Anders 1976). The source of these soybeans was INTSOY at the University of Illinois.

(4) Guatemala–Dr. Albert N. Plant, USAID, Guatemala City, and Dr. Ricardo Bressani, Jefe de la Div. de Ciencias Agricolas y de Alimentos, Carretera Roosevelt, Zone 11–AP Postal 1188, Guatemala; (5) Iran–Dr. N.C. Amirshahi, Head, Dep. of Agronomy, Karaj Agric. College, Univ. of Tehran, Iran; (6) Iraq–Mr. Haji Abdul Sattar, Director, Research Ind. Crops, Abu Ghraib Agricultural Research Station, Baghdad, Iraq. For a report on the results of these trials, see Fadhil-Alzubaidi 1975. Note: This is the earliest document seen (Dec. 2007) concerning soybeans in Iraq.

The cooperator in Belize in 1973 was (p. 35): Dr. J.P. Cal, Agronomist, Department of Agriculture, Central Farm–Belmopan, Caijo District, Belize, British Honduras. No results for soybeans in Belize are given.

The cooperator in Nicaragua in 1973 was (p. 36): Mr. Mack H. McLendon, Deputy Food & Agri. Officer, USAID/Nicaragua, c/o American Embassy, Managua, Nicaragua. No results for soybeans in Nicaragua are given. Address: Asst. Prof., Dep. of Agronomy, INTSOY, Univ. of Illinois at Urbana-Champaign.

692. *Queensland Agricultural Journal.* 1974. Soybean diseases. 100(6):194-201. June.

• ***Summary:*** Discusses soybean diseases caused by bacteria, fungi, and viruses. Also the site of infection, host stages, recognition, and control of pathogens. Address: Brisbane, Queensland 4000, Australia.

693. Filet, G.F.; Williamson, A.J.P. 1974. Soybean trials in Brisbane Valley. *Queensland Agricultural Journal* 100(8):351-56. Aug.

• ***Summary:*** "Soybeans have been grown in the Brisbane Valley for many years." In 1968 only 36 ha of soybeans were grown commercially in this valley, but during the 1972-73 season this increased to 1,600 ha. Address: Agriculture Branch, Dep. of Primary Industries, Brisban, Queensland, Australia.

694. Malynicz, G.L. 1974. Whole soyabeans, a protein supplement for sweet potato in pig rations. *Papua New Guinea Agricultural Journal* 25(1-2):15-17. Aug. [10 ref. Eng]*

• ***Summary:*** In these feeding trials with 46 pigs in Papua New Guinea, sorghum was used as the control diet. Cooked soya beans performed better than raw ones, but in both cases the control diet performed better. Adding salt improved the results. Address: Tropical Pig Breeding and Research Centre, Dep. of Agriculture, Stock and Fisheries, Goroka, Papua New Guinea.

695. Lawn, R.J.; Byth, D.E. 1974. Response of soya beans to planting date in South-Eastern Queensland. II. Vegetative and reproductive development. *Australian J. of Agricultural Research* 25(5):723-37. Sept. [18 ref]

• ***Summary:*** Sensitivity to photoperiod is the single most important factor affecting the adaptation of soya bean genotypes to various latitudes and planting dates. "Quantitative variation among soya bean genotypes in photoperiodic response has resulted in the development of a maturity group classification within the United States, as a broad basis for characterizing cultivar agronomic response. Under this system, cultivars classified as group 00 are those which will flower rapidly in long days, and which are therefore suitable for the higher latitudes of soya bean adaptation (45-50 degrees). In contrast, group VIII cultivars require relatively shorter days to flower, and are adapted to lower latitudes (25-30 degrees)." Some varieties even exhibit "day neutrality;" they do not respond to day length. Address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067; 1. Present address of Lawn: Div. of Tropical Agronomy. CSIRO, Cunningham Lab., St. Lucia, Qld. 4067.

696. Agriculture Branch Officers. 1974. Soybean varieties for next season. *Queensland Agricultural Journal* 100(10):487-88. Oct.

• ***Summary:*** This brief article and long table are quite similar to those published in the Nov. 1973 issue of this journal. The 12 districts are almost identical. The varieties are listed in four ways: Regular, irrigated, rain-grown, and for trial. The one new variety is Gilbert. All the varieties previously recommended are still recommended. Address: Brisbane, Queensland 4000, Australia.

697. Brown, Lester R.; Eckholm, Erik P. 1974. Our dietary habits: Should they be changed? For what reasons? *Vital Issues* 24(2):104. Oct. [1 ref]

• ***Summary:*** This Vital Issue is drawn from the authors' forthcoming book *By Bread Alone* (Praeger 1974). "Since the time of Malthus, the world food problem has been seen as a food-population problem. Currently population growth continues to generate demand for more food, but, in addition, affluence has emerged as a major claimant on world food resources." It examines the encouraging shift from beef and animal products to vegetable sources of protein, and the economy, ecology, health issues, inefficiency, and waste in beef production. A chart gives per capita meat consumption (including poultry but not fish) for various countries in 1960 and 1972, and the percentage increase during that time as follows (pounds per year): USA (208, 254, +22%), Australia (234, 235, 0%), France (168, 212, 26%), Canada (167, 211, 26%), United Kingdom (158, 171, 8%), West Germany (144, 192, 33%), Sweden (109, 112, 3%), USSR (80, 104, 30%), Italy (70, 136, 94%), Yugoslavia (62, 75, 21%), Spain (51, 96, 88%), Japan (14, 41, 364%). Address: 1. Senior Fellow; 2. Associate Fellow. Both: Overseas Development Council, Washington, DC.

698. Predicasts, Inc. 1974. World manufactured soybean foods. Special Study No. 108. Predicasts, Inc., 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, OH 44106. vi + 93 p. Dec. 24. No index. 28 cm. Research Analyst: Frederick M. Ross.
• ***Summary:*** Contents: 1. Introduction. 2. Summary. 3. Economics of Soybean Foods: Soybeans, soy flour, meat extenders (based on extruded textured soy flour), synthetic meat (based on spun isolates). 4. Industry structure: General, $1,000 million food and feed giants (ADM, Cargill, Central Soya, General Mills/Takeda Chemical, Nabisco, Ralston Purina/Fuji Oil, and Esmark [Swift]), other major manufactured soy food companies (Unilever, General Host [New York], Miles Laboratories/Worthington & Kyowa Hakko Kogyo, A.E. Staley Mfg. Co., Stange [Chicago, Illinois], Chambers & Fargus [Humberside, England]), food industry structure. 5. Demand for manufactured soybean products: Demand for meat & substitutes, supply of natural meat, demand for meat substitutes, demand for soy flour. 6. North America: United States, Canada. 7. Latin America: General, Argentina, Brazil, Mexico, Other Latin America (Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay). 8. West Europe: General, France, West Germany, Italy, Spain, United Kingdom, Other West Europe. 9. East Europe: General, Hungary, Poland, USSR, Other East Europe. 10. Africa: General, Egypt, Nigeria, South Africa, Other Africa & Mideast. 11. Asia: General, China, India, Indonesia, Japan, Pakistan, Other Asia. 12. Oceania: Australia, New Zealand, Other Oceania.

Most sections contain numerous tables, mostly on meat and meat substitute consumption, and raw protein consumption, by country. Address: 200 University Circle Research Center, 11001 Cedar Ave., Cleveland, Ohio 44106. Phone: 216-795-3000.

699. Sisifa, A.F. 1974. A critical look at livestock improvement in Tonga. *South Pacific Bulletin (Noumea, New Hebrides)* 24(4):42-44. Fourth quarter.
• ***Summary:*** One-third of all imports into Tonga consists of foodstuffs. The Kingdom spends more than $500,000/year on imports of meat and meat products. The need to increase local meat production cannot be overemphasized. Tonga also needs to develop balanced feeds and a system of scientific feeding.

"Soybean has been shown to do well under local conditions and should provide a good return to growers. In the future, soybean may completely replace meat meal as the major protein source in feed."

Tonga has done very little work in improving its pastures. Glycine is one of the various pasture species that has been tried with some success.

Note: This periodical is the "Official Journal of the South Pacific Commission." Address: Livestock Officer, Dep. of Agriculture, Tonga.

700. Stapleton, Thomas. 1974. Infant feeding in the People's Republic of China. *PAG Bulletin* 4(4):31-33. Dec. Abstracted from Notes by a Visitor to China. [1 ref]
• ***Summary:*** "To nearly every medical observer who visits China, one of the most remarkable achievements is the virtual elimination of infant and childhood malnutrition." Breastfeeding and cow's milk have played an important role in this process. "In the early stages following Liberation, when cow's milk was in short supply, the Chinese developed a number of infant foods prepared from locally grown products, such as rice and soybeans." Address: Prof. of Child Health, Univ. of Sydney, Australia.

701. Bromfield, K.R. 1974. Soybean rust and soybean rust research. *Soybean Genetics Newsletter* 1:45-52. *
• ***Summary:*** Summarizes the distribution of soybean rust and studies conducted by researchers in Australia, Taiwan, Indonesia, Thailand, and the USA. Stresses the epidemiology of the disease. Address: USDA ARS, Plant Disease Research Lab., P.O. Box 1209, Frederick, Maryland 21701.

702. Carter, O.G. 1974. Detailed yield analysis of the effect of different planting dates on seven soybean varieties. *Iowa State J. of Research* 48(4):291-310. [5 ref]*
Address: Dep. of Agronomy, Sydney Univ., Sydney, New South Wales, Australia.

703. Keogh, R.C. 1974. *Phakopsora pachyrhizi* Syd.: the causal agent of soybean rust. *Australian Plant Pathology Society Newsletter* 3:5. *
• ***Summary:*** "In Australia, soybean rust was restricted to areas of Queensland, but recent reports indicate that it is in the vicinity of the major soybean producing areas of northern New South Wales and the Queensland Darling Downs. Besides soybean, rust has been reported on other cultivated and native legumes. Uredospores germinate well from 18 to 25°C, but no germination occurred above 32 or below 8°C. Germination is restricted by high light intensities and the germ tube displays a strong negative phototropism. The fungus enters host tissue by direct penetration" (from AVRDC 1992, #0203). Address: Australia.

704. Keogh, R.C. 1974. Studies on *Phakopsora pachyrhizi* Syd.: the causal agent of soybean rust. MSc thesis, University of Sydney. 148 p. *
Address: Australia.

705. Korte, R. 1974. The role of legumes in alleviating protein deficiency in Papua New Guinea. *Science in New Guinea* 2(1):6-14. [12 ref]*

• ***Summary:*** Gives the protein and oil content of the seed, and the estimated yields of the following plants grown in New Guinea: Soybean, peas, groundnuts, winged beans *(Psophocarpus tetragonolobus), Dolichos lablab [Lablab purpureus], Phaseolus lunatus, Phaseolus vulgaris.* Address: Dep. of Public Health, Konedobu, Papua New Guinea.

706. *Research Report, University of Sydney, S.* 1974. Co-operative soybean variety evaluation program. * Address: Sydney, Australia.

707. **Product Name:** Sanitarium Health Foods TVP Textured Vegetable Protein [Smoked Flavour, Roast Flavour Chunky Pieces, Roast Flavour Mince Style, Savoury Flavour, Southern Flavour, and Sweet & Sour Flavour], and Unflavoured T.V.P.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1974.
Ingredients: Savoury: Soy flour, salt, dried yeast, vegetable oil, vegetable flavouring syrup.
Wt/Vol., Packaging, Price: 300 gm box. Later canned.
How Stored: Shelf stable.
Nutrition: Savoury: Protein 35.0%, moisture 6.5%, ash 11.0%, fibre 2.5%, carbohydrate 24.0%, fat 21.0%.
New Product–Documentation: Label. 1980, undated. Box. 13 by 9 inches. Full color. Photo shows TVP as is and in a skillet with rice. "The New Food Fantastic. Ideal for Casseroles, Stews, Burgers, Patties, Soups, Curries." Letter from Sanitarium Health Food Co. 1981. Leaflet. 1981? 6 panels. Red and brown. "The new food fantastic. Sanitarium TVP Textured Vegetable Protein... From Sanitarium... The people who believe food should not only taste good, it should be good for you." With 5 recipes. Leaflet. 1981. Full color, yellow background. "Sanitarium presents 30 exciting recipes with a difference from around the world... The difference is TVP. Textured Vegetable Protein." Soya Bluebook. 1982. p. 61. "Canned vegetable protein foods and textured vegetable protein." 1985. p. 86.

Letter from Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1974.

708. **Product Name:** Sanitarium Health Foods Tender Bits (Vegetable Protein Bits).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1974.
Ingredients: Wheat gluten, sauce [incl. soy sauce], onion, flour, vegetable oil, water added.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1974. "Soy sauce is the first ingredient in the sauce."

709. **Product Name:** Sanitarium Health Foods Casserole Mince (Minced Vegetable Protein).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1974.
Ingredients: Wheat gluten, flour, soya sauce, hydrolysed vegetable protein, sauce, water added.
How Stored: Shelf stable.
Nutrition: Per 110 gm (¼ can): Protein 16 gm.
New Product–Documentation: Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1974.

710. **Product Name:** F.G. Roberts Unsweetened Muesli.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1974.
Ingredients: 1995: Rolled wheat, rolled oats, sultanas, raisins, currants, soy grits, natural bran, peanuts, sunflower kernels, lecithin.
Wt/Vol., Packaging, Price: 1 kg plastic bag.
How Stored: Store in a cool, dry, dark place.
New Product–Documentation: Plastic bag on which Label is printed, sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. 5.5 by 11.25 by 1.5 inches. Light blue, dark blue, and yellow on white. Illustration of F.G. Roberts (face, wearing a hat). "Naturally wholesome. Naturally from Australia."

711. Yang, Charles Y. 1974. Soybean rust. *AVRDC, Seminar Series.* 22 p. *
• ***Summary:*** A good overview of soybean rust. This fungal disease "has been recorded in the northeastern, central, and southwestern provinces of China. It has also been reported in the USSR, Korea, Okinawa, Taiwan, the Philippines, Australia, Ceylon, India, Malaysia, Thailand, Cambodia, and Vietnam. Cultivated varieties of soybean known to be rust resistant in the past are now susceptible. Taichung 4 had much more field tolerance to soybean rust, with relatively fewer pustules, than other cultivated varieties. Two physiological races of this rust have been identified through their characteristic pathogenic reactions... It is believed that there can be 6-8 cycles of the rust produced within one growing season" (from AVRDC 1992, #452). Address: Kyushu Univ., Japan.

712. Cribb, A.B.; and Cribb, J.W. 1974. Wild food in Australia. Sydney, Australia: William Collins Publishers. 240 p. 23 cm. *

• ***Summary:*** The taproot of this wild perennial relative of the soybean is reported to have the flavor of licorice, and to have been chewed by Aborigines in Australia.

713. U.S. Department of Agriculture. 1974. The annual report on activities carried out under the Public Law 480, 83d Congress, as amended, during the period January 1 through December 31, 1973. Washington, DC: U.S. Government Printing Office. See p. 94-101.

• ***Summary:*** Table 18 is titled "Title II, Public Law 480–total commodities shipped by program sponsor, fiscal year 1973." The main program sponsors and distributing agencies, listed alphabetically, are AJJDC (American-Jewish Joint Distribution Committee), CARE, CRS (Catholic Relief Service), CWS (Church World Service), LWR (Lutheran World Relief), SAWS (Seventh-day Adventist World Service), UNICEF, UNRWA (United Nations Relief and Works Agency), and WRC (World Relief Commission). All of these are Private Voluntary Organizations (PVO/PVOs), registered with USAID. The following foods containing soy protein were distributed: CSM (corn soya mix), WSB (wheat soya blend), and small amounts of soya flour. The vegetable oil which was shipped to many countries was soybean oil; it is not recorded here. The foods containing soy protein were sent in the following amounts (in thousands of pounds) to the following continents and countries: Africa (24,340 CSM and 6,8857 WSB): Algeria (1 WSB), Botswana (1,398 CSM), Burundi (464 CSM), Cameroon (47 CSM), Central African Republic (67 CSM), Chad (1 CSM and 1 WSB), Congo (115 WSB), Dahomey (124 CSM), Ethiopia (395 CSM), Gabon (46 WSB), Gambia (211 CSM), Ghana (843 CSM and 1,272 WSB), Ivory Coast (546 WSB), Kenya (409 CSM and 400 WSB), Lesotho (299 WSB), Liberia (1,247 CSM and 487 WSB), Malagasy (365 CSM and 2 WSB), Malawi (210 CSM), Mali (230 CSM), Mauritania (235 CSM), Morocco (908 CSM and 890 WSB), Niger (289 CSM), Nigeria (1,197 CSM), Rwanda (82 CSM and 570 WSB), Senegal (643 CSM), Sierra Leone (2,309 CSM), Sudan (3,826 CSM), Swaziland (57 CSM), Tanzania (3,991 CSM and 5 WSB), Togo (1,083 CSM and 1,562 WSB), Tunisia (2,368 CSM and 485 WSB), Upper Volta (878 CSM and 14 WSB), Zaire (419 WSB and 190 WSB), Zambia (44 CSM).

Europe (27 CSM): Malta (27 CSM).

Near East-South Asia (269,188 CSM and 94,141 WSB): Afghanistan (1 CSM), Bangladesh (99794 CSM and 54,631 CSB), Egypt (3,593 CSM and 2 WSB), Gaza [occupied by Israel since 1967] (1,509 CSM and 3,564 WSB), India (156,216 CSM and 15,768 WSB and 775 soya flour), Iraq (997 CSM), Jordan (2,319 CSM and 536 WSB), Jordan-West Bank [occupied by Israel since 1967] (549 CSM and 1,186 WSB), Lebanon (227 CSM and 411 WSB), Nepal (1,000 CSM and 55 WSB), Pakistan (9,933 WSB), Sri Lanka (1,000 WSB and 50 soya flour), Syria (470 CSM and 473 WSB), Turkey (6,582 WSB), Yemen (People's Democratic Republic of Yemen, or South Yemen) (151 CSM), Yemen (Yemen Arab Republic) (2,513 CSM).

East Asia (41,450 CSM and 20,694 WSB): Fiji (2 CSM and 2 WSB), Indonesia (268 CSM and 12,981 WSB), Korea (1,997 CSM), Laos (2,378 CSM and 750 WSB), Macao (29 CSM), Malaysia (1,124 CSM and 65 WSB), Philippines (22,416 CSM), Singapore (10 WSB), Vietnam (13,236 CSM and 6,886 WSB).

Latin America (94,598 CSM and 42,404 WSB): Bolivia (1,534 CSM), Brazil (33,197 CSM and 5,676 WSB), British Honduras [Belize] (333 CSM and 110 WSB), Chile (548 CSM and 6,038 WSB), Colombia (13,043 CSM and 5,202 WSB), Costa Rica (2,792 CSM), Dominica (78 CSM), Dominican Republic (11,584 CSM and 3,486 WSB), Ecuador (2,253 CSM and 5,446 WSB), El Salvador (1,343 CSM and 2,466 WSB), Grenada (41 CSM), Guatemala (4,007 CSM and 1,090 WSB), Guyana (631 CSM), Haiti (1,581 CSM and 3,395 WSB), Honduras (1,297 CSM and 1,523 WSB), Jamaica (1,150 CSM and 657 WSB), Nicaragua (6,850 CSM and 4,126 WSB), Panama (853 CSM and 699 WSB), Paraguay (3,385 CSM), Peru (7,522 CSM and 1,993 WSB), St. Lucia (81 CSM), St. Vincent (51 CSM), Trinidad and Tobago (2 CSM and 1 WSB), Uruguay (442 CSM and 496 WSB).

Grand total: 429,603,000 lb of CSM and 164,124,000 lb of WSB. Agencies distributing the most CSM and WSB (in million lb): CARE 204, UNICEF 163, CRS 151.

Note: This is the earliest document seen (Aug. 2009) concerning soybean products (soy flour, CSM, or WSB) in Chad, Mauritania, and Niger. This document contains the earliest date seen for soybean products (cereal-soy blends) in Chad, Mauritania, and Niger (1973); soybeans as such had not yet been reported by that date. Address: Washington, DC. Phone: 703-875-4901 (1991).

714. Khaleque, A.; Wallace, G.M. 1975. Studies on the processing and properties of artificial milk. IV. Evaluation (in vitro) of nutritional quality of proteins in various heat-processed soymilks. *Bangladesh J. of Scientific and Industrial Research* 10(1&2):148-57. Jan/April. [27 ref]

• ***Summary:*** Presoaking soybeans in a sodium carbonate solution gives soymilk with an improved taste and nutritional value. Address: Dep. of Food Technology, Massey Univ., Palmerston North, New Zealand. 1. Present address: B.C.S.I.R. Laboratories, Dacca, Bangladesh.

715. Rothschild, Emma. 1975. A reporter at large [The world food economy and the 1974 World Food Conference near Rome, Italy]. *New Yorker.* May 26. p. 40-44, 49-50, 52, 54, 56, 58, 62-66, 68-70, 72-73, 76. See p. 50, col. 3.

• ***Summary:*** The world is in the midst of a food crisis. To many it seems to be a result of drought and natural disaster. But actually is a "sign of lasting insecurity in the world food economy. It is political and economic, and it could have been avoided." As with petroleum problems, it has been "caused by the decisions and policies of people and governments."

The World Food Conference, convened in November 1974, brought together more than 5,000 delegates including many high government officials. From the USA: Henry Kissinger (secretary of state), Earl Butz (secretary of agriculture), and Dr. Don Paarlberg (chief economist at the USDA). The Flanigan Report tried to analyze the world food crisis. William R. Pearce, a vice-president of Cargill, Inc., "said that in the nineteen-sixties the United States 'had excess capacity in corn and soybeans,' and therefore set out to encourage the development of a different diet pattern around the world.'" It encouraged the use of feed grains in meat production. American grain exports increased from 32 million tons in 1971 to 76 million in 1973. Canada and Australia also had huge grain exports. The USSR, Japan, and the European countries (collectively) each now feeds more than 100 million tons of grain to its animals. The USDA had succeeded in reducing U.S. surpluses.

716. Fung, Wye-poh. 1975. Effect of soya bean milk on the healing of gastric ulcers: A controlled endoscopic study. *Medical J. of Australia* 1(23):717-18. June. [4 ref]
• ***Summary:*** Although the effect on gastric ulcer healing was not significant, soya bean milk was shown to be effective in the relief of peptic ulcer pain. The mean ulcer healing grade was 1.600 in the soya bean milk group as compared with 1.000 in the control group. Address: Dep. of Medicine, Univ. of Singapore.

717. Food Systems Branch and Research Branch, Agriculture Canada; Grain Marketing Office, Industry, Trade and Commerce. 1975. Plant proteins in Canada: Utilization for human food. Canada. iii+ 163 p. Sept. 28 cm. [25+ ref]
• ***Summary:*** The title page depicts this as "An assembly of information describing protein crops, status of ingredient manufacturers and marketing, potential markets, research effort, government incentives and regulations, protein status reports, and sources of information."

Contents: Introduction. Protein crops: 1. Trends in breeding Canadian protein crops. 2. Statistical summaries, by crop, of production area, yield, production, farm price, farm value and protein yield.

Manufacturing: 1. Manufacturers, distributors, and vegetable protein associations in Canada, U.S.A., United Kingdom, Australia and Japan (incl. Canadian Vegetable Protein Association, Don Mills, Ontario; Food Protein Council (USA)). 2. Extraction processes for broad bean protein, oilseeds, soybean protein, rapeseed protein, wheat gluten, oat protein, corn refining, alfalfa protein.

Markets: 1. Canada's position in world plant protein markets. 2. Canada's position in world gluten markets. 3. Projected growth of plant protein food ingredients.

Tariffs: 1. Tariff description, by country and BTN number. 2. Canadian tariffs on vegetable flours, protein, oilseeds, oilcake and meal. 3. Countries entitled to British Preferential Tariff, Most Favoured National Customs Tariff, General Tariff, General Preferential Tariff.

Regulations: 1. Status of plant protein under Canadian Food and Drug Regulations. 2. Canadian regulations–protein and fat content in simulated and extended meat products. 3. Problems in evaluating protein quality. 4. Aspects of current U.S. legislation. 5. Proposed revised regulations for plant protein in U.S.A.

Government incentives: 1. Federal government assistance programs. 2. Provincial government assistance programs. 3. POS Pilot Plant Corporation.

Research effort: 1. Estimate of research effort, in man-years, on utilization of plant protein in Canada. 2. Non-exhaustive list of research topics on plant protein in Canada.

Status of Canadian plant protein development: 1. Canadian role in development of plant proteins. 2. Production and utilization of sunflower. 3. Current status of leaf protein. 4. Status of rapeseed protein. 5. SCP status. 6. Review of buckwheat as a potential source of human food. 7. Status of oat protein.

U.S.A. situation: 1. Review of "U.S. Plant Protein Situation." 2. Non-conventional food sources. Major sources of information on plant proteins. Address: Canada.

718. Brown, Lester R. 1975. The politics and responsibility of the North American breadbasket. *Worldwatch Paper* No. 2. 45 p. Oct. No index. 22 cm. [3 ref]
• ***Summary:*** North America has emerged as a major supplier of food to the rest of the world. World grain trade has changed dramatically during the past 40 years. Grains now occupy more than 70% of the world's cropland area. Prior to World War II (in the period 1934-1938), all of the world's geographic areas except Western Europe (which imported 24 million metric tons) were net exporters of grains. Latin America was the world's leading grain exporter (9 million metric tons), followed by North America (5 MMT), and Eastern Europe and the USSR (5 MMT). Asia exported 2 MMT.

However since that time Asia has turned from a small grain exporter to the world's largest grain importer (47 MMT in 1976, led by Japan, China, and India). Other regions with large grain imports are Eastern Europe and the USSR (27 MMT), Western Europe (17 MMT), Africa (10 MMT), and Latin America (3 MMT). In 1976 North America exported 94 MMT of grain, and Australia and New Zealand exported 8 MMT. The main reason for this change is the varying rates of population growth. Areas with high population growth rates have not been able to grow enough food to keep up with population. Many countries in these regions have a population growth rate of 3% or more per year which, if allowed to continue, will lead to a nineteenfold population increase within a century. Japan (with a population equal to nearly half that of North America squeezed into an area smaller than California) is the world's leading food importer, relying on imports to feed 62% of its 110 million people.

Brazil has recently emerged as a soybean exporter. Address: Worldwatch Inst., 1776 Massachusetts Ave., Washington, DC 20036.

719. Singer, Peter. 1975. Animal liberation: A new ethics for our treatment of animals. New York, NY: New York Review. Distributed by Random House. xix + 301 p. Oct. Illust. Index. 18 cm. Paperback edition published Sept. 1977 by Avon Discus. [200* ref]

• ***Summary:*** This book, a milestone in and "bible" of the animal rights movement worldwide, first popularized the concepts of animal rights and speciesism (pronounced SPEE-shees-iz-um, a term first used in 1973) as logical extensions of human rights and racism. It helped to make 1975 a year that saw explosive growth in the animal rights and vegetarian movements. Singer is an Australian academic.

The author, an Australian philosopher, argues for an end to oppression and exploitation of non-human animals, discusses animal experimentation and factory farming, and presents vegetarianism as an opportunity to take a political, economic, and moral stance in our daily lives.

Contents: Preface (It begins: "This book is about the tyranny of human over nonhuman animals. This tyranny has caused and today is still causing an amount of pain and suffering that can only be compared with that which resulted from the centuries of tyranny by white humans over black humans. The struggle against this tyranny is a struggle as important as any of the moral and social issues that have been fought over in recent years"). Acknowledgments. 1. All animals are equal... or why supporters of liberation for blacks and women should support animal liberation too. 2. Tools for research... or what the public doesn't know it is paying for. 3. Down on the factory farm... or what happened to your dinner when it was still an animal. 4. Becoming a vegetarian... or how to reduce animal suffering and human starvation at the same time. 5. Man's dominion... a short history of speciesism. 6. Speciesism today... defenses, rationalizations, and objections to animal liberation. Appendices: Cooking for liberated people (incl. Seventh-day Adventists, bread, peanut butter, tahini, miso, hummus, and Tartex, Chinese recipes, mung bean sprouts and tofu, Indian recipes, Middle Eastern recipes, flat Arabian bread, chickpeas and felafel, Italian recipes, macrobiotic recipes {incl. soy sauce, soybeans}, meat substitutes {incl. TVP, Granburger, Protoveg, Itona, Vitpro, Loma Linda meatless frankfurters, imitation bacon bits}, and milk substitutes–often made from soybeans), further reading, organizations.

Singer's book was not just a philosophical treatise. It was a call to action. Invoking the concept of speciesism, Singer deplored the historic attitude of humans toward non-humans as a "form of prejudice no less objectionable than racism or sexism," and urged that the liberation of animals become the next great cause after civil rights and the women's movement. Singer's popular book produced two important effects. First, it reintroduced to the anti-vivisectionist cause an intellectual basis, a philosophical orientation, and a moral focus. Second, it attracted to the animal rights cause a host of new activists who started many new organizations. The most active and visible of these has been PETA (People for the Ethical Treatment of Animals, in Washington, DC), which by 1988 was thought to have 200,000 dues paying members in the USA.

Singer maintains that: "to treat animals as resources and argue about when use is sustainable, is a classic example of economic rationalism running heedlessly over non-economic values. We should no more hand our wild animals over to the tender mercies of the market than we should hand our children over to the same market forces. Neither children nor wild animals are a 'product' or a 'resource' at all."

Note: This is the earliest document seen (Oct 2009) that mentions Itona, a British maker of soymilk and meat alternatives. Address: Australia.

720. Heenan, D.P.; Carter, O.G. 1975. Response of two soya bean cultivars to manganese toxicity as affected by pH and calcium levels. *Australian J. of Agricultural Research* 26(6):967-74. Nov. [30 ref]

• ***Summary:*** Manganese toxicity is one of the main factors contributing to low yields on low pH soils. The problem is usually corrected by addition of lime (calcium carbonate) to the soil; this raises the pH and lowers the plant's uptake of manganese. Address: Dep. of Agronomy and Horticultural Science, Univ. of Sydney, Sydney, NSW 2006.

721. Hymowitz, Theodore; Newell, Christine. 1975. A wild relative of the soybean: Of the nine currently known species of the *Glycine* genus, the most unusual is *G. falcata*, a native of Australia. *Illinois Research* 17(4):18-19. Fall.

• ***Summary:*** *Glycine falcata* is a wild perennial species indigenous to the dry regions of Australia. A map shows that its distribution is most widespread in the northern half of Australia. It spreads and multiplies by rhizomes bearing single-seeded pods that grow underground, and by multi-seeded above-ground pods like those of the cultivated soybean. The seeds of *G. falcata* are much smaller and more rectangular than those of typical cultivated soybeans. Photos show: The underground pods and root nodules. A flowering specimen with delicately trifolate leaflets. The rectangular seeds (full size, and close-up with scanning electron microscope). Address: 1. Assoc. Prof. of Plant Genetics; 2. Reseaarch Asst. Both: Univ. of Illinois, Urbana, Illinois.

722. Williamson, A.J.P. 1975. Soybean, sorghum and millet for the Maryborough area. *Tropical Grasslands* 9(3):259-60. Nov.
• ***Summary:*** The article starts: "When we think of crops that might replace beef production it is worthwhile considering soybeans, sorghums and millets..." Address: Dep. of Primary Industries, Brisbane.

723. Newell, C.A.; Hymowitz, T. 1975. *Glycine canescens* F.J. Herm., a wild relative of the soybean. *Crop Science* 15(6):879-81. Nov/Dec. [6 ref]
• ***Summary:*** An accession of *Glycine canescens*, a wild relative of the cultivated soybean, was studied with respect to morphological, cytological, and chemical characteristics. This species, which was collected near Alice Springs, Northern Territory, in the middle of Australia, has not previously been available in the USA for examination. Cytological analysis of mitosis and meiosis gave a chromosome number of 2n = 40. Preliminary screening indicated that this species was resistant to the disease powdery mildew *(Microsphaera diffusa)* Cke. and Pk. A map shows the distribution of *G. canescens* in Australia. Address: Crop Evolution Lab., Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

724. Saxon, E.A. 1975. Food consumption in Japan: A review of selected Japanese data and research results. *Bureau of Agricultural Economics, Australia, Occasional Paper* No. 32. *

725. **Product Name:** Enzyme-Active (Raw) Soya Flour.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: 729-1738.
Date of Introduction: 1975.
Ingredients: Soybeans.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. This company makes raw (enzyme active) soy flour for human consumption.

Talk with Paul Smith of Soy Products of Australia Pty. Ltd. 1995. This product was introduced during the 1970s. "We don't regard this as a major product."

726. Evans, L.T. ed. 1975. Crop physiology: Some case histories. London and New York: Cambridge University Press. vii + 374 p. Illust. Index. 24 cm. [213 soy ref]
• ***Summary:*** Contents: List of contributors (each chapter is by different authors). Foreword. 1. Crops and world food supply, crop evolution, and the origins of crop physiology. 2. Maize. 3. Sugar cane. 4. Rice. 5. Wheat. 6. Soybean. 7. Pea. 8. Potato. 9. Sugar beet. 10. Cotton. 11. The physiological basis of crop yield.

The Foreword, by L.T. Evans, begins: "Only nine crops are dealt with in this book, yet between them they contribute more than two-thirds of the dry weight, half of the protein and a quarter of the oil and fat in our diet, and half of the fiber we use. Our dependence on these major crops is by no means diminishing..." "In terms of edible dry weight more than two-thirds of the world's nutritional requirements of human food is supplied by the cereals. Of the proteins supplied, half is contributed by the cereals, as compared with less than one-third from animal sources. The rest of the proteins for humans is derived largely from pulses."

Contents of Chapter 1: Introduction. Crops and the world food supply: Alternative sources of food, crop yield. Physiological aspects of crop plant evolution: Reduced dissemination and increased seed size, crops, weeds and adaptability, change in form, changes in composition. A short history of crop physiology: Photosynthesis, leaf growth and canopy development, translocation, storage, ideal plant type.

Chapter 6, "Soybean," by Richard Shibles, I.C. Anderson, and A.H. Gibson (Shibles and Anderson are from Dep. of Agronomy, Iowa State Univ., Ames, Iowa; Gibson is from Div. of Plant Industry, CIRO, Canberra, ACT, Australia) has the following contents: Introduction. Seedling establishment. Root growth and function: The root system, Nodulation and nitrogen fixation, nodule function. Top growth and development: The vegetative structure, canopy growth and dry matter accumulation, transpiration. Reproductive development: Regulation, flowering, pod and seed development, protein and fat. Yield determining processes: Photosynthesis (the leaf, the canopy), respiration and photorespiration, translocation (anatomy, assimilate distribution), nutrient uptake and nitrogen metabolism, stress physiology. Yield: Limits and limitations to yield, approaches to yield improvement. Address: Div. of Plant Industry, CSIRO, Canberra, ACT, Australia.

727. Food and Agricultural Organization of the United Nations. 1975. Soybeans: Area harvested, yield, and production. *FAO Production Yearbook (Rome, Italy)* 29:103.
• ***Summary:*** The following nations are listed for the first time as soybean producers in the *FAO Production Yearbook*. F = FAO estimate. India: Harvested 32,000F ha in 1973, 13,000 ha in 1974, and 160,000F in 1965.

Sri Lanka: Harvested 1,000 ha in 1974 and 1,000F in 1975.

New Zealand: Achieved a yield of 3,000 kg/ha in 1975.

Name changes: Laos is changed to Lao P. D. Rep. [People's Democratic Republic]. Vietnam DR and Vietnam Rep. are merged to create Vietnam CR [Communist Republic?].

728. Matheson, E.M. 1975. Annual crop production. Brisbane: Australian Vice-Chancellor's Committee. 13 p. *

729. U.S. Department of Agriculture. 1975. The annual report on activities carried out under Public Law 480, 83d Congress, as amended, during the period July 1, 1973 through June 30, 1974. Washington, DC: U.S. Government Printing Office. See table 17.
• ***Summary:*** Table 17 is titled "Title II, Public Law 480–total commodities shipped by program sponsor, fiscal year 1974." The main program sponsors and distributing agencies, listed alphabetically, are AJJDC (American-Jewish Joint Distribution Committee), CARE, CRS (Catholic Relief Service), CWS (Church World Service), LWR (Lutheran World Relief), SAWS (Seventh-day Adventist World Service), UNICEF, UNRWA (United Nations Relief and Works Agency), and WRC (World Relief Commission). All of these are Private Voluntary Organizations (PVO/PVOs), registered with USAID. The following foods containing soy protein were distributed: CSM (corn soya mix), CSB (corn soya blend), WSB (wheat soya blend), and small amounts of soya flour. The vegetable oil which was shipped to many countries was soybean oil; it is not recorded here.

Foods containing soy protein were distributed to the following countries or areas:

Africa: Botswana, Burundi, Cameroon, Central African Republic, Chad, Congo–Belgian, Dahomey, Ethiopia, Gabon, Gambia, Ghana, Ivory Coast, Kenya, Lesotho, Liberia, Malagasy, Mali, Mauritania, Morocco, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somali Republic, Sudan, Swaziland, Tanzania, Togo, Rhodesia, Upper Volta, Zaire, Zambia.

Near East–South Asia: Bangladesh, British Solomon Islands, Egypt, Gaza, India (incl. soy flour), Gaza, Jordan–East, Jordan–West Bank, Nepal, Pakistan, Sri Lanka, Turkey, Yemen, Palestine Refugee Program.

East Asia: Cambodia, Indonesia, Korea, Laos, Malaysia, Philippines, Singapore, Vietnam.

Latin America: Antigua, Bolivia, Brazil, British Honduras, Chile, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru, St. Kitts, St. Lucia, St. Vincent, Uruguay. Address: Washington, DC. Phone: 703-875-4901 (1991).

730. Wright, Louise. 1975. The road from Aston Cross: An industrial history, 1875-1975. Imperial House, Leamington Spa, Warwickshire, England: Smedley–HP Foods Ltd. 84 p. Illust. 25 x 19 cm. No index.
• ***Summary:*** This book was published on the centenary of the HP Foods Co. The story begins in 1875 when Edwin Samson Moore bought land in Tower Road, Aston Manor, and built his vinegar brewery, registered as the Midland Vinegar Company. He is believed to have taken up agencies for Mellors Sauce and Banquet Sauce. In 1886 the wheat sheaf was registered as the company's trade mark. In 1901 The Moores registered the offices of F.G. Garton Sauce Manufactory at Tower Road. In 1903 H.P. Sauce was launched and sold in Canada. Today it contains soy sauce. In 1902 adjacent Vulcan Brewery was acquired by the Moores. In 1904 the name H.P. was re-registered by the Midland Vinegar Co. In 1906 hundreds of donkey carts toured Great Britain to introduce H.P. Sauce. In 1913 H.P. Sauce was sold in the USA, and by 1917 in France and South Africa. In 1924 the Midland Vinegar Co. was sold to the British Shareholders' Trust, then floated as a public company named HP Sauce Ltd.

In 1930 HP Sauce Ltd. acquired Lea & Perrins Ltd. of Worcester by an exchange of shares. Lea & Perrins Inc. of New York remained a separate entity. Three members of the Perrins family (Dyson, Capt. Allan, and Col. Charles) joined the board of HP Sauce Ltd. Captain Alan Perrins visited Australia to arrange for the manufacture of HP Sauce and Lea & Perrins Sauce there. In 1931 manufacture of HP Sauce started in Sydney, Australia.

In 1940 bottling of Lea & Perrins Worcester Sauce was moved to Tower Road. In 1942 because of shipping losses, HP Sauce was manufactured by E.D. Smith and Sons at Winona, Ontario, Canada. In 1945-46 the bottling of Worcester Sauce was transferred back to Worcester.

In 1950 the purchase of market research data from A.C. Nielson started. In 1957 J.E. Lea was appointed managing director of Lea & Perrins. In 1966 first computer installed.

In 1967 HP Sauce Ltd. was acquired by the Imperial Tobacco Co. In 1969 H.P. Fruity Sauce (which now contains soy sauce) was launched.

In 1972 the company was renamed Smedley-HP Foods Ltd. (Smedley-HP for short) and the company offices were moved in phases to Imperial House, Leamington Spa.

Note: In 1916 the Dyson Perrins Laboratory was established at Oxford University. Founded with an endowment from Charles Dyson Perrins, heir to the Lea & Perrins Worcestershire sauce company, it was the main centre for research into organic chemistry at Oxford from 1916 to 2003, when it was retired. "During its 87 year working life, the laboratory had an extremely distinguished career; it can claim a stake in shaping the scientific careers of two Nobel Laureates, namely Lord Todd (1957) and Sir John W. Cornforth (1975) who passed their formative years as young chemists in the laboratories" (Source: Wikipedia). Address: Warwickshire, England.

731. Wright, Louise. 1975. History of Lea & Perrins Worcestershire Sauce (Document part). In: Louise Wright. 1975. The Road from Aston Cross: An Industrial History, 1875-1975. Imperial House, Leamington Spa, Warwickshire, England: Smedley–HP Foods Ltd. 84 p. See p. 30-37. 25 x 19 cm.

• ***Summary:*** "Another important matter was on the move: A merger between HP Sauce Ltd. and the world famous makers of Worcestershire sauce, Lea & Perrins. Mr. John Wheeley Lea and Mr. William Perrins went into partnership in 1823. Mr. Lea was druggist in Worcestershire; his friend had a chemist's shop in Evesham. Over their Christmas festivities, they decided two heads were better than one and on New Year's Day [1823] pooled their resources to develop the Worcester business as Lea & Perrins. They set up as wholesalers and retailers of pharmaceuticals, toiletries, cosmetics and groceries. Long before the days of ice-cream parlours and Coca-Cola, their shop on Broad Street, Worcester, became the precursor of the modern American drug-store.

"Both men were analytical chemists. Both were aware of the advantages of marketing their own products and their fist catalogue listed more than three hundred items. Although trading from a quiet country town, they kept themselves informed and studied world trade. Aware of the rapid growth of Queen Victoria's empire, they also realised that the industrial revolution was rapidly altering Birmingham and the Black Country. Soon their medicinal products were in great demand throughout the Midlands. Later they opened a chemist's shop in London, patronised by Queen Adelaide.

"Their concentrated Essence of Sarsaparilla was recommended for scorbutic affections (scurvy), cutaneous (skin) diseases and for freeing the system from the ill-effects of taking mercury. They recommended Taraxacum (dandelion coffee) for liver complaints because of its gentle diuretic and diaphoretic effects. Presumably their customers were sufficiently conversant with medical terms to know that a diuretic excites the discharge of urine and a diaphoretic produces perspiration.

"Mr. Lea & Mr. Perrins were perfecting their medicines, hair lotions and marrow pomades when Marcus, Lord Sandys visited the shop in Worcester. Late Governor of Bengal, he had retired to his country estate at nearby Ombersley Court, and would be obliged if they would make up one of his favourite Indian sauces. They obliged. Having already arranged their own supplies of spices and dried fruits, from Asia and the Americas, they had the ingredients to hand. Scrupulously following his lordship's recipe, they made the required quantity, plus some for themselves. One taste was enough. The sauce was ghastly: an unpalatable, red hot, fire water. His lordship was entirely satisfied. The remainder however was consigned to a cellar below the shop and there it stayed until the annual spring cleaning and stocktaking.

"It was on the point of being poured away when Mr. Lea and Mr. Perrins detected its appetising aroma. Tasting it once again they discovered it had matured into a rare and piquant sauce. The sauce was saved, more was made. Customers were persuaded to try the new Worcestershire Sauce, and did not need more persuasion: the sauce was an instant success. Sales rose. In 1842, Lea & Perrins sold 636 bottles. In 1845, a manufactory was set up in Bank Street, Worcester. Ten years later the yearly sales were up to 30,000 bottles of Worcestershire Sauce. Travellers covered Great Britain and there were agencies in Australia and the United States. As well as sauce, they found a steady export market for their medicines. No sensible traveller left England without a Lea & Perrins medicine chest."

"By 1862, the firm's international trading had become an extensive two-way traffic. An American firm in New Jersey was asking them to find an English market for hermetically sealed 3 lb cans of fresh fruits, tomatoes, green corn and oysters.

"When it became necessary to build a new factory in Midland Road, Worcester in 1897, Mr. Lea & Mr. Perrins used the latest steel girder construction. The factory rises over vast cellars, which house hundreds of casks of maturing sauce and maturing raw materials. No anchovy is allowed into the cellars under a year old. It matures for at least another year before being used in the sauce manufacture. The steel girders of the cellar roof, which supported the circular yard and its traffic of one ton drays in 1897, are now having to be re-inforced to take 32 ton freight-liners. A royal warrant was granted to the firm by Edward VII in 1904 and has been proudly held ever since. It helped alleviate trouble with imitations of their sauce. In the High Court of Justice in 1906, Mr. Justice Swinfen Eady decreed that no firm other than Lea & Perrins be allowed to call their Worcestershire Sauce, 'The Original' or 'The Genuine'.

"In 1823, William Perrins' son married Sarah Dyson of Huddersfield. Their grandson christened Charles William Dyson, was known as Dyson Perrins. A benefactor to the City of Worcester, to his home town of Malvern and to his old University of Oxford, where he developed his great love for the earliest printed books... He also inaugurated the Dyson Perrins Porcelain Museum at Worcester.

"After the First World War, Lea & Perrins rapidly expanded. When the merger with HP Sauce Ltd. was settled by mutual agreement in 1930, it had been a private limited company for some time. The branch in the United States, Lea & Perrins Inc., was not officially brought into the new company until a year later, but a gentleman's agreement between the two boards had sufficed while the trans-Atlantic marriage was being formally established. The amicable relationship dated back to Mr. Lea and Mr. Perrins.

"The believed in having friendly dealings with their overseas agents. Foremost among them were their New York agents, John Duncan & Sons. Established since 1819 as importers of wines, quality foodstuffs and preserves, they began to handle Worcestershire Sauce in 1840. Soon, they were handling ever-increasing amounts. During the succeeding forty years, close friendship developed between the two family businesses; indeed, the Duncans have adopted Dyson as one of their own family names.

"By 1875, the demand for Worcestershire sauce had spread throughout the United States. It was agreed to import the sauce in casks and bottle in New York. On the personal side the friendship between the families became so strong that the secret formula was divulged and the rights of manufacture granted to the Duncans. After eight years of manufacture in their various New York factories, they acquired in 1910 a nine storey building in West Street. Following their partnership with HP Sauce Ltd., they remained in West Street until expansion forced them to move to the Industrial Park at Fair Lawn, New Jersey." Continued. Address: Warwickshire, England.

732. Wright, Louise. 1975. History of Lea & Perrins Worcestershire Sauce (Document part–Document part II). In: Louise Wright. 1975. The Road from Aston Cross: An Industrial History, 1875-1975. Imperial House, Leamington Spa, Warwickshire, England: Smedley–HP Foods Ltd. 84 p. See p. 30-37. 25 x 19 cm.

• ***Summary:*** Fair Lawn, near Route 4 out of New York, is an industrial park. Behind the lawns and dignified facades "Lea & Perrins Inc. alone produce 500 bottles of sauce every minute of every working day. The company is now a member of the Imperial Foods Group, but retains its American identity, with its own board of directors and its own purchasing and marketing procedures. The company has been marketing HP Sauce for some years." It is known as HP Steak Sauce.

An early engraved advertisement (facing p. 32) shows an innkeeper or restaurateur introducing Lea & Perrins' Sauce to three well-dressed gentlemen at a table. Two photos (facing p. 33) show: 1. A view of the front of the Lea & Perrins factory, built at Midland Road, Worcester, in 1897. 2. "The disastrous fire in 1964, which destroyed much of the building. With fine cooperation by management and employees, the sauce manufacture was held up for a mere 10 days." In the New Zealand town of Te Wairoa, destroyed by a volcanic eruption in 1886, an undamaged bottle of Lea & Perrins Worcestershire sauce was found preserved by the volcanic dust. It is on display in the museum there (p. 34).

Plate 51 shows three ads published in 1871 by Lea & Perrins in three Australian newspapers (the *Coulburn Herald, Bathurst Free Press,* and the *Manaro Mercury)* to caution people against purchasing fraudulent imitations of their "celebrated Worcestershire Sauce." The two agents in Australia were Montefiore, Joseph & Co. (Sydney), and John Lee & Co. (Maitland). The sauce was exported by Lea & Perrins (Worcester) and by Crosse and Blackwell (London); it was sold by "Grocers and Oilmen universally."

Plate 54 states: "Lea & Perrins have been exhibiting since the historic Chicago Exhibition [in Illinois] in 1876, which celebrated the first hundred years of American Independence. The vase and bottled where were displayed there, are on permanent exhibition in the entrance hall of the offices of Lea & Perrins Inc., New York." Plate 55 shows the products of HP Sauce Ltd. and Lea & Perrins Ltd. on display at the British Industries Fair of 1949. Pages 42-43 discuss problems faced by Lea & Perrins in Worcester during World War II. "An army medical unit had taken over their factory, leaving only a small, sealed section in which to continue the highly secret process of making the sauce... One sniff was enough; there is no mistaking a cask of five-year-old anchovies." Lea & Perrins soon moved its bottling machinery from Worcester to Aston Cross. Plate 59 shows a empty glass bottle of Lea & Perrins sauce from 1880. Plate 60 shows seven old Lea & Perrins Worcestershire sauce bottles. The oldest two, made of green glass with glass stoppers, were both filled in 1866. Two others are from about 1870. The earliest one with a label is from 1920. Plate 83 shows old bottles (with labels) of Worcestershire Sauce made by other manufacturers in Kobe, Japan; Cardiff, Wales; Hamburg-Altona [Germany; Altona became part of Hamburg in 1937]; the United Kingdom, and Portugal. Address: Warwickshire, England.

733. Skurray, Geoffrey R.; Osborne, Christopher. 1976. Nutritional value of soya protein and milk coprecipitates in sausage products. *J. of the Science of Food and Agriculture (London)* 27(2):175-80. Feb. [20 ref]

• ***Summary:*** Meat contributes to the average Western diet: 29% of the fat, 28% of the protein, 36% of the nicotinic acid, 29% of the iron, 25% of the vitamin A, 20% of the riboflavin, 17% of the thiamin, and 2% of the calcium.

Sausages were prepared by replacing 60% of the meat proteins with an isolated soy protein (Promine D, made by Central Soya) or a milk coprecipitate. Growth rates and plasma amino acid levels in rats fed diets based on these products showed that the nutritional values of these non-meat proteins were markedly lower than meat sausages. Address: School of Food Sciences, Hawkesbury Agricultural College, Richmond, NSW 2753, Australia.

734. Population Reference Bureau, Inc. 1976. World population growth and response: 1965-1975, a decade of global action. Washington, DC. viii + 271 p. Illust. No index. 28 cm.

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• ***Summary:*** Contains detailed population information on every country in the world, listed alphabetically by region. Contents: Some highlights: The world population situation. Region and country situations: Africa, Asia, Europe, Latin America, Caribbean Islands, Near East, Northern America, Oceania. Aid to developing countries: Multilateral agencies, USAID, private organizations. Demographic data. World population data. Glossary. Address: 1754 N Street, N.W., Washington, DC 20036.

735. Potter, Julia M.; Nestel, P.J. 1976. Greater bile acid excretion with soy bean than with cow milk in infants. *American J. of Clinical Nutrition* 29(5):546-551. May. [22 ref]

• ***Summary:*** Substitution of soymilk for cow milk, which lowers the plasma cholesterol in all infants, leads to an increase in bile acids and probably also in cholesterol excretion in young infants.

Note: *Webster's Dictionary* defines bile acid (a term first used in about 1881) as "any of several steroid acids (as cholic acid) of or derived from bile." Bile acids are related to cholesterol, and their excretion from the human body is considered desirable. This is the earliest document seen that mentions the effect of soya on excretion of bile acids. Address: Dep. of Clinical Science, The John Curtin School of Medical Research, The Australian National Univ., Canberra.

736. Fiji Government. 1976. Extracts from Fiji's Seventh Development Plan, 1976-1980. Chapter 11. Agriculture. *Fiji Agricultural Journal* 38(1):1-31. Jan/June.

• ***Summary:*** Page 11 states: "Cereals and legumes: 11.74. Major expansion in the cultivation of sorghum, maize and pulses will be undertaken. A large scale, 3,200 hectare project with sorghum, soya-bean, peanut, pulse and livestock rotations is proposed for Vanua Levu, subject to satisfactory results from a pilot project and feasibility investigations. This proposed project will primarily produce animal feedstuff with pulses substituting present imports for human consumption." Table 11.16 (p. 11) shows soya-bean area scheduled to grow from 100 ha in 1976 to 810 ha in 1980 with a yield of 1.85 tonnes/ha. Address: Fiji.

737. Lambert, Michael. 1976. Results of 1975-76 soya bean trials in certain South Pacific territories. *South Pacific Commission, Information Circular* No. 76. 11 p. Oct. [Eng]

• ***Summary:*** Discusses the results of small-scale trials of 15 INTSOY soybean cultivars: Jupiter, Hampton 2664, Hardee, Pickett 71, Cobb, Bossier, Davis, Tracy, Forrest, Columbus, Clark 63, Woodworth, Williams, Calland, and Semmes.

On Fiji, the cultivars tested were unsuitable. Trials were conducted at Legalega near Nadi (Viti Levu) and at Bua (Vanua Levu). Previous trials using varieties from countries on about the same latitude as that of Fiji gave better results.

In New Caledonia, 6 cultivars yielded more than 2.5 tonnes/ha of seed. In French Polynesia, the trials were conducted at the Papara Experimental Station, route de la Carrière, Tahiti, under the direction of M. Robert Yau (Akui). A preliminary trial was conducted from 11 June to 16 Sept. 1975 using the following six varieties: Bertoua, Improved Pelican, Bossier, Kent, Jupiter, C.E.S., and Kailua. The first five of these were obtained from IRAT, Bouake Station, Ivory Coast; the sixth came from the University of Hawaii at Honolulu. A table shows the results. Bertoua have the best yield, 2.875 tonnes/ha, followed by Bossier at 2.714 t/ha. In the INTSOY trials (from Dec. 1975 to April 1976), twelve cultivars yielded more than 2 tonnes/ha and four cultivars (Davis, Forrest, Bossier, Semmes) more than 4 tonnes/ha.

In Tonga, the cultivar Jupiter gave good yields when planted from January to July; planting in January gave the best results, whereas planting in August or September led to failure to flower and negligible yields. Note 1. This is the earliest document seen (March 2010) concerning the cultivation of soybeans in Tonga.

The Introduction begins: "Early in 1975, the South Pacific Commission approached the International Soybean Program of the University of Illinois, USA (INTSOY) to determine whether it would be possible to conduct soybean variety trials in Pacific territories wishing to participate.

"The prospects for soybean in the islands are admittedly subject to reservations; at the present time it has no potential as a human food, and all experiments along these lines with non-Asian peoples have led to failure. On the assumption, however, that soybean production is geared either to industrial processing into locally used products, or to export of locally produced seed, oil or cakes, the agronomical research findings will give a first indication of the viability of the soybean if not as a large-scale crop, at least on a level compatible with local economic and technical limitations." Soybean could also be used for pig and poultry feed, and as a soil-improving crop.

Soybean trials have already been conducted in New Caledonia, Tonga, and Fiji, but (as far as the writer knows) only Tonga has made a thorough study of seasonality.

Note 2. This is the earliest document seen (March 2010) concerning soybeans in French Polynesia (including Tahiti), or the cultivation of soybeans in French Polynesia. This document contains the earliest date seen for soybeans on French Polynesia, or the cultivation of soybeans on French Polynesia (11 June 1975). The source of these soybeans was IRAT, Bouake Station, Ivory Coast, and the University of Hawaii at Honolulu. Address: Tropical Agriculturalist.

738. Bernard, R.L.; Hittle, C.N. 1976. United States national soybean germ plasm collections. *INTSOY Series* No. 10. p. 182-85. R.M. Goodman, ed. Expanding the Use

of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** A full-page table (p. 183) gives the following information on soybean germ plasm collections worldwide: Country and curator, address, number of accessions, nature and origin of accessions. There are major collections in the following places: Toulouse, France (500 accessions). Amravati, Haharashtra (1,800), and Pantnagar, Uttar Pradesh (4,000), India. Bogor, Indonesia (400). Hiratsuka, Kanagawa prefecture (2,928), and Iwate University, Morioka (200 Glycine species), Japan. IITA, Ibadan, Nigeria (2,000). Harbin, and Kirin Province, China. Pretoria, South Africa (600). Suweon (300 Glycine species), and Cheong Kyang, Seoul (1,300), Korea. Algot Holmberg and Soner AB, Norrkoping, Sweden (1,200). AVRDC, Tainan (9,000), and Taichung (2,800), Taiwan. Urbana, Illinois (4,100), and Stoneville, Mississippi (1,700), USA. Leningrad, USSR (2,500).

There are additional collections in Australia, Bulgaria, Hungary, Philippines, [Southern] Rhodesia (Salisbury [Harare]), and Romania.

Table 1. Divisions of USDA soybean germ plasm collections (Urbana, Stoneville, Total). Table 2. Maturity grouping of the USDA soybean germ plasm collection, 1976 (In the northern region [maturity group 00 to IV] there are 237 named varieties, 51 FC [Forage Crop] strains, 2,999 P.I. [Plant Introduction] strains, and 3,287 total. In the southern region [maturity group V to IX] there are 101 named varieties, 39 FC [Forage Crop] strains, 1,514 P.I. strains, and 1,654 total).

Table 3. History of soybean introductions into the United States. The earliest period given is 1898-1907; the great surge in soybean introductions was in 1929-32 during the Dorsett-Morse expedition to East Asia; A total of 11,594 strains have been introduced. Table 4. Maturity grouping and origin of accessions through 1976 in USDA wild soybean (Glycine soja Sieb. and Zucc.) germ plasm collection (there are 361 accessions; Country of origin: Japan 180, Korea 134, China and Taiwan 32, USSR 15). Table 5. Species distribution of USDA perennial Glycine collection, 1976 (8 species *[G. canescens, G. clandestina, G. falcata, G. latrobeana, G. tabacina, G. tomentella, G. wightii]* and 161 accessions from Australia, India, Africa, Taiwan, Japan, Philippines, Ethiopia).

Note: The assignment of FC numbers began in about 1911 and was discontinued in 1957. Address: USDA.

739. Bromfield, K.R.; Yang, Charles Y. 1976. Soybean rust: Summary of available knowledge. *INTSOY Series* No. 10. p. 161-64. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** Contents: Introduction. Geographical and seasonal appearance. Breeding for rust resistance. Additional rust control measures. Biology and life cycle. International working group.

Geographical appearance: Soybean rust was first recorded, observed or collected on soybeans in various countries as follows: 1934–Australia: First collected, but serious proportions were not recorded until 1970-71.

1960s early–Since then in Taiwan it has been a serious economic soybean disease. 1966–First reported in Thailand.

1970–Pantnagar, India: First observed. It was severe in 1974 but absent in 1975.

1970–In the Philippines, rust first became especially serious this year, but was known before that time.

In Indonesia, about 80% of the soybean crop is grown on the island of Java. "Soybean rust occurs throughout Java, but it is thought to be more common and more severe in western Java, the region of the island that has the greatest number of rainy days and the highest total rainfall. Soybean rust is considered the most serious soybean disease in Indonesia. Observed yield reductions have ranged up to 81%."

Rust has not yet been reported on soybeans in the United States, nor elsewhere in the Western Hemisphere. Address: 1. USDA ARS, Plant Disease Research Lab., P.O. Box 1209, Frederick, Maryland 21701.

740. Byth, D.E. 1976. Some concepts of soybean improvement in the lower latitudes. *INTSOY Series* No. 10. p. 18-25. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [6 ref]
• ***Summary:*** Contents: Introduction. General considerations of soybean improvement. Photoperiodic response and adaptation. Regional adaptation and agronomic use. Plant habit. Germ plasm base. Response to environments: Soils and soil fertility, disease and pest resistance, environmental adaptation. Seed quality: Chemical composition, physical quality. Soybean rust is mentioned as a regionally important disease that may affect soybean improvement in the lower latitudes. Address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Australia.

741. Goodman, Robert M. ed. 1976. Expanding the use of soybeans. *INTSOY Series* No. 10. xv + 261 p. Proceedings of a Conference for Asia and Oceania. Held Feb. 1976 in Chiang Mai, Thailand (College of Agric., Univ. of Illinois at Urbana-Champaign). [100+ ref]
• ***Summary:*** Content: Introduction. Opening addresses. General sessions: Production, protection, utilization and economics.

Symposia: Soybean rust. Biology and control of major insect pests of Asian soybeans. Breeding tropical soybeans. Small scale soybean processing: What is needed? Extension research to the village farmer.

Country reports: Current status of soybean production and research in–Australia, Bangladesh, India, Indonesia, Iran, Japan, Korea, Malaysia, Philippines, Kingdom of Saudi Arabia, Sri Lanka, Thailand.

Closing address, by R.W. Howell. List of contributed papers. Abbreviations and units of measure. Address: Dep. of Plant Pathology and INTSOY, Univ. of Illinois, Urbana, IL.

742. Howell, R.W. 1976. Solutions to soybean production problems through international cooperation. *INTSOY Series* No. 10. p. 257-59. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** "This has been a truly international conference. Twenty-one countries, 16 of them in Asia or Oceania, are represented... Over 230 people have attended, and there have been more than 80 presentations...

"The challenge of extension, which was the climax of the conference, is where the real rewards come... Dr. Yookti's observation is especially apt: 'Research without extension is meaningless; extension with research is empty.'... Extension workers are the bridge between the researcher in his ivory tower and the clientele for whom we are all working. That bridge carries two-way traffic. Extension workers are more than mere conveyors of wisdom from the researchers to the farmers or small processors and homemakers. Extension workers can provide research workers with information about problems in the real world." Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL.

743. *INTSOY Series.*1976. Conference delegates. No. 10. p. xii-xv. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** The following number of participants came from the following countries: Australia (3). Bangladesh (4). Hong Kong (1). India (4). Indonesia (20). Iran (6). Iraq (1). Japan (6). Malaysia (12). Pakistan (1). Philippines (9). Puerto Rico (4). Saudi Arabia (3). Singapore (2). South Korea (3). Sri Lanka (5). Switzerland (1). Taiwan (8). Thailand (120). United Kingdom (2). USA (17).

Ten patrons of the conference are also listed.

744. Kogan, Marcos. 1976. Soybean disease and insect pest management. *INTSOY Series* No. 10. p. 114-21. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [51 ref]
• ***Summary:*** Contents: Introduction. Main features of current soybean pest management systems: Correlation between crop and pest phenologies, establishment of economic damage thresholds, improvement of sampling procedures, understanding behavioral and ecological characteristics of pests and their natural enemies, use of selective pesticides, use of cultural control practices, use of varieties with multiple pest resistance, avoidance of conflicting actions in pest control, use of dynamic simulation models. Main soybean insect pests in the Orient and Australia. A hypothetical pest management problem. Phases of an integrated pest management program: Phase I (transplantation of existing technology), Phase II (Expansion of local data base), Phase III (Integration). Conclusion. Acknowledgment. Address: Section of Economic Entomology, Illinois Natural History Survey and IL Agric. Exp. Station, Univ. of IL, Urbana, IL.

745. Rejesus, Romeo S. 1976. Insect pest diversity and succession in Asian soybeans. *INTSOY Series* No. 10. p. 97-103. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [18 ref]
• ***Summary:*** Lists a large number of insect pests. Contents: Introduction. Pest diversity: Insects and other arthropods in Philippine soybeans, insect diversity in other Asian countries. Pest succession: Wet season, dry season. Developmental approach. Appendix I is a partial list of soybean insect pests in the following Asian countries: Indonesia, India, Solomon Islands (Stapley 1972; 2 species), Micronesia (Gressitt 1954, 14 species on soybeans), and Thailand (Napompeth 1975, 13 species).

Note: Gressitt (1954) did NOT mention soybeans in Micronesia. Address: Dep. of Entomology, College of Agriculture, Univ. of the Philippines at Los Baños, College, Laguna, Philippines.

746. Russell, J.S.; Lawn, R.J. 1976. Current status of soybeans in Australia. *INTSOY Series* No. 10. p. 219-21. R.M. Goodman, ed. Expanding the Use of Soybeans (College of Agric., Univ. of Illinois at Urbana-Champaign). [16 ref]
• ***Summary:*** Contents: Introduction. Varieties. Agronomy. Diseases. Insects and weeds. Research.

"Although soybeans were grown in Australia over 50 years ago, it is only in the last 5 years that the crop has become significant. In the past, only small areas were sown to soybeans because suitable varieties were not available and because there was no awareness of the importance of photoperiodic response with respect to adaptation and agronomic and cultural practices. Climate has also restricted expansion of soybean production, and undoubtedly will continue to be a problem, because only small areas of Australia have adequate summer rainfall."

A table shows: In 1968-69 only 1,739 tonnes were produced on 2,090 ha (mean yield: 832 kg/ha). Major expansion began in 1970-71. In 1974-75 some 68,750 tonnes were produced on 50,500 ha (mean yield: 1,361 kg/ha). Most of the current production is in Queensland, with the remainder principally in New South Wales. A considerable proportion of the areas sold, especially in New South Wales, is irrigated. Production occurs largely between 26° and 33° south latitude and much of the future expansion should occur in this region. Address: CSIRO (Commonwealth Scientific and Industrial Research Organization), Div. of Tropical Agronomy, Brisbane, Queensland, Australia.

747. Anders, M. 1976. Soybean variety studies in Tonga. *Fiji Agricultural Journal* 38(2):77-80. July/Dec. New Series. [3 ref]
• ***Summary:*** On 10 March 1971, in the first experiment, eighteen soyabean varieties were directly seeded into three replications of a completely randomized block field design. Each plot contained rows 15 meters long, with 90 cm between rows and 4 cm between plants. The soil was Vaini Clay, which consists of two volcanic ash layers over a limestone coral base. The seeds were not inoculated. The plot was fertilized and sprayed with Maneb and Sevin for disease and insect control. Each plot was harvested 110 to 142 days after sowing.

On 8 April 1971, in experiment No. 2, six more varieties were planted. On 4 August 1971, in experiment No. 3, sixteen varieties were planted; all but two had been used in trials 1 or 2. In replication 4, seed inoculation was first used. On 27 June 1973, in experiment No. 4, nine varieties were planted, only two of which had appeared in the 1971 trials. Seed inoculation was used for all varieties. Observations on individual plants showed that seed inoculation increased plant yield by about 50%. Photoperiodicity was found to be an extremely critical factor. Varieties in Maturity Groups VI-VIII were found to be best adapted to the shorter daylengths of lower latitudes and Tonga winter.

Table 1 shows the results (days to harvest and yield in tonnes/ha) of the four field experiments using 35 varieties tested. Another 32 varieties were grown in observation plots in Tonga during 1971 to 1976.

After evaluating all the yield and timing observations, six varieties were selected as having potential as good producers in Tonga for specific planting times: HLS 147 (best yield of all varieties and all trials: 3.8 tonnes/ha), Heron 36, Improved Pelican, Davis, and Clark 63. Jupiter was selected as having potential for extended planting times.

Note 1. This document contains the earliest date seen for soybeans in Tonga or the cultivation of soybeans in Tonga (10 March 1971). The source of these 1971 soybeans is unknown but HLS 147 probably came from Tanzania–where "HLS" stands for "Hernon Light Speckled" (see Auckland 1966). The source of the soybeans planted in June 1973 was INTSOY at the University of Illinois.

Note 2. Letter from Tevita F. Holo, Head of Research Division, Ministry of Agriculture and Forestry, Research Division, Vaini Research Station, P.O. Box 14, Nuku'alofa, Kingdom of Tonga. The location of the 1971 soybean trial was at the Vaini Research Station, Nualei, 8 miles east of Nuku'alofa, which in 1990 became the capital of Tonga.

Note 3. Other documents show that the author's full name is Merle M. Anders. Address: Research Div., Ministry of Agriculture, Tonga.

748. Williamson, A.J.P. 1976. Soybeans in Queensland. *Queensland Agricultural Journal* 102(6):573-82. Nov/Dec.
• ***Summary:*** Contents: Introduction. Uses of soybean (and production in Queensland). The soybean plant. Varieties. Description of varieties. Rotation. Soils, fertilizer and nodulation. Land preparation and tillage. Time of planting. Row and plant spacings. Planting. Irrigation. Pests and diseases. Harvesting. Yields. Seed handling and storage. Fodder and hay. Marketing. Soybeans in the regions.

Soybean production in Queensland has risen from 749 tonnes in 1963 to a current peak of 52,542 tonnes in 1975. During the same period yield has grown from 447 kg/ha to 1,592 kg/ha. As production has grown, imports have dropped and Queensland has become more self-sufficient. In 1966 Queensland produced only 1.35% of the soybeans it consumed. By 1975 this figure had risen to 90.23%. "The main areas of production in Queensland are the Darling Downs, the West Moreton and the South Burnett regions." Address: Agriculture Branch, Queensland, Australia.

749. **Product Name:** Addison Soy Flour, Nu-Soy Bread Mix, and Nu-Soy Concentrate.
Manufacturer's Name: Barton Addison & Sons Pty. Ltd.
Manufacturer's Address: 18 Gray St., Kogarth, NSW, Australia 2217.
Date of Introduction: 1976.
New Product–Documentation: *Soybean Digest Blue Book.* 1976. p. 45. Note that the "Soy Concentrate" is listed in the "Flour, Flakes, and Grits" category. Maybe it is not a true soy protein concentrate. Soya Bluebook. 1981. p. 62.

750. Dale, J.; Gibbs, A. 1976. Soybean virus Z: Its characteristics and taxonomy. *Intervirology* 6(6):325-32. *

751. Dever, K.J.; Voigt, A.L. 1976. Vegetable production methods at the Kabiufa Adventist High School gardens. In: K. Wilson and R.M. Bourke, eds. 1976. Papua New Guinea Food Crops Conference Proceedings. Port Moresby, PNG: Department of Primary Industry. 388 p. See p. 205-10. Held in 1975. [1 ref. Eng]*
• ***Summary:*** Soya beans were among the vegetables grown at Kabiufa. Cultivation practices are discussed. Address: Kabiufa, Papua New Guinea.

752. *Fiji Ministry of Agriculture, Fisheries, and Forests, Annual Report.*1976. Soyabeans. For the year 1973. p. 14.

Parliament of Fiji. Parliamentary Paper No. 7. 54 p. *
• ***Summary:*** In the section on crops (p. 16-18), entomological observations and research on soybeans are discussed. Address: Fiji.

753. Keogh, R.C. 1976. The host range and distribution of *Phakopsora pachyrhizi* in New South Wales. *Australian Plant Pathology Society Newsletter* 5(5):51-52. *
• ***Summary:*** "The host range of soybean rust and the distribution of the disease on native host species and on soybean in New South Wales was determined. A total of 32 leguminous species from 22 genera were hosts" (from AVRDC 1992, #205). Address: Australia.

754. **Product Name:** Sanitarium Health Foods Canned Vegetable Protein Sausages.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1976.
Wt/Vol., Packaging, Price: Can.
New Product–Documentation: *Soybean Digest Blue Book*. 1976. p. 37.

755. Sumbak, J. 1976. Trial work with soyabeans and sugarcane particularly in the Markham Valley. In: K. Wilson and R.M. Bourke, eds. 1976. Papua New Guinea Food Crops Conference Proceedings. Port Moresby, PNG: Department of Primary Industry. 388 p. See p. 221-28. Held in 1975. [Eng]*
• ***Summary:*** Research on soyabeans over the last 4 years shows that insect pests and lack of adequate rainfall at the time flowering and pod development can severely limit soyabean growth in the Markham Valley. Address: Agricultural Experiment Centre, Dep. of Agriculture, Stock and Fisheries, Bubia, Papua New Guinea.

756. Turnbull, L. 1976. Soybean a new crop for the Kaipara New Zealand district. In: Proceedings of the 6th Annual Conference of the Agronomy Society of New Zealand. See p. 9-13. *

757. Bromfield, K.R. 1976. World soybean rust situation. In: L.D. Hill, ed. 1976. World Soybean Research [Conference I: Proceedings]. Danville, Illinois: Interstate Printers and Publishers, Inc. xvii + 1073 p. See p. 491-500. [25 ref]
• ***Summary:*** Contents: Distribution of soybean rust. Taxonomy of the pathogen. Etiology. Epidemiology. Disease losses. Control. Current research. References.

"In tropical and subtropical areas of Asia, soybean rust is a serious disease... At AVRDC [Taiwan], it has been observed that plants of all ages can be infected in the field if inoculum is present and if weather conditions are favorable. In Australia, this disease was found at coastal locations in Queensland and New South Wales. Yield losses causes by soybean rust were not consistent, varying from 10% to 80%. Soybean varieties immune to rust had not been found and no available varieties with a high degree of physiological resistance occur. Use of resistant cultivars, chemical, biological and cultural controls and current research in these areas are summarized" (from AVRDC 1992, #62). Address: Plant Disease Research Lab., ARS, USDA, Frederick, Maryland.

758. Lawn, R.J.; Byth, D.E. 1976. Soybean. In: J.V. Lovett and Alec Lazenby, eds. 1976. Australian Field Crops. Vol. 2: Tropical Cereals, Oilseeds, Grain Legumes and Other Crops. Sydney: Angus & Robertson Publishers. 328 p. See p. 198-231. [152 ref]
• ***Summary:*** An excellent review of the literature from an Australian viewpoint. Contents: Introduction. Uses. Taxonomy, origin, and distribution. Morphology. Crop growth and development: Seedling establishment, vegetative and development, reproductive growth and development, root growth, nodulation and nitrogen fixation. Eco-physical basis of adaptation: Photoperiod, temperature, soils, water requirements. Soybean improvement in Australia: Plant introduction, cultivars in Australia, soybean breeding, priorities for breeding in Australia (germplasm base, breeding for specific environmental adaptation, diseases and insects, seed quality, nutritional responses). Agronomic principles and practice: Planting date, population and row width, planting, weed control, pests and diseases (insects, diseases). Research needs.

The soybean belongs to the family Leguminosae, subfamily Papilionoideae, and the genus *Glycine* L. The first formal soybean breeding program in Australia was started by CSIRO in 1958 in southeastern Queensland; prior to that useful selection had been conducted by the Queensland Department of Primary Industries. Until the late 1960s only small soybean areas existed in Australia (500-2,000 ha) mainly in the South Burnett region. Major expansion began in 1970-71, and has continued to the present, so that Australian production is now nearing local demand. Most of the current commercial soybean production occurs in Queensland, in the Darling Downs and St. George, the Fassifern, Lockyer and Brisbane Valleys, and the South Burnett region. The major production area in New South Wales is centered in the Gwydir and Naomi Valleys on the northwestern plain, with smaller areas in the coastal Northern Rivers District, and in the Lachlan and Macquarie Valleys of the central west. Irrigated farms account for most of the soybean area, particularly in New South Wales. It appears likely that most of the production will continue to be irrigated in the in the major grain-producing areas of Australia, although dryland acreage is expanding in the coastal and sub-coastal areas, an in northern Queensland.

"Most of the current soybean production in Australia is carried out under contract to the major processors, and is used primarily for oil and meal production."

In recent years, active soybean introduction and/or evaluation programs have been pursued by various organizations in Queensland and New South Wales, and to a lesser extent in other states of Australia. Most of the current cultivars are direct accessions of named cultivars from the USA. Exceptions include the cultivars Wills and Semstar (farmer releases in Queensland, and the most widely grown cultivars, particularly in Queensland) and Gilbert, Ross, and Daintree. The last three cultivars were developed from a cross of Mamloxi (CPI 17192 from Nigeria) x Avoyelles (CPI 15939 from Tanzania) by D.E. Byth, and were released for low latitude use in 1970-71. Address: 1. CSIRO Div. of Tropical Crops and Pastures, Brisbane; 2. Dep. of Agriculture, Univ. of Queensland, Australia.

759. Neufeld, Don F. 1976. Seventh-day Adventist encyclopedia, 2nd ed.: Sanitarium Health Food Company. Washington, DC: Review and Herald Publishing Assoc. 1640 p. See p. 1285-86.

• ***Summary:*** "A chain of health food factories, wholesale branches, and retail shops in Australia and New Zealand, operated by the Health Food Department of the Australasian Division... Headquarters for the firm are at 148 Fox Valley Road, Wahroonga, New South Wales, Australia.

"Products include Weet-Bix, a flaked-wheat breakfast-food biscuit; cornflakes, and other cereal foods; Marmite, a yeast-extract flavoring; peanut butter; vegetarian meats and textured vegetable protein; and soybean milk

"In 1973 the company was operating 12 factories in Australia and New Zealand and 8 large wholesale branches. There were 68 shops and 4 cafes scattered in the main cities of the two countries; 11 of these retail branches were in company-owned buildings. Total net worth was approximately $24.2 million. Approximately 1,700 workers were employed, and the company's products were stocked throughout the grocery trade in Australia and New Zealand. A growing export trade was also being developed, principal markets being the Southern Pacific and nearby Asian countries.

"The gross annual revenue sales were $46 million. In 1973 the company realized a profit of $2.7 million, of which $1.362 million went directly to the treasury of the Australasian Division for mission use. In addition, nearly half of the general administrative expenses of the division are met by the company as operational costs.

"History. The motivating influence leading to the establishment of health food work in Australasia is found in addresses given by Mrs. E.G. White at the Brighton, Victoria, camp meeting in 1893 and in Melbourne, Victoria, in 1895. She spoke of different aspects of the work, and urged the leaders to move forward along medical lines, including manufacturing of health foods and establishing of vegetarian restaurants. In response the Australasian Union Conference on Oct. 31, 1895–Resolved that the Executive Committee be urged to take steps to commence such work in the various large cities of these Colonies by the establishment of both houses and depots for the supply of Health Foods, Sanitary Clothing, etc. as the way may open (Minutes, p. 30).

"In 1897 a consignment of wheat biscuits, granola, gluten, and caramel cereal [grain coffee] arrived from Battle Creek, Michigan. A small factory was rented in North Fitzroy, Melbourne, where the production of granola and caramel cereal was begun. The firm, registered April 27, 1898, was first known as the Sanitas Supply Company and then as the Sanitarium Health Food Agency. Processing was done under the direction of E.C. Halsey, from Battle Creek.

"The results of the Melbourne enterprise were not satisfactory, and Mrs. White counseled that the factory be moved to Cooranbong to be operated in conjunction with the Avondale School for Christian Workers (now Avondale College), to which the managing committee agreed... At this time the firm's present name was adopted. Operations at Cooranbong began in 1899.

"In all these early moves Mrs. White, who was residing in Australia at the time, gave important counsel for the health food work and shared in many of the major decisions relative to the development of the business. At first all sales of health foods were made through conference tract societies, but a retail shop was opened in Sydney in 1902 in association with the first vegetarian restaurant. However, the business was not financially successful, and by 1904, when the whole health food enterprise was heavily in debt, many of the denominational leaders favored closing it... Success was achieved, and in 1906 the first donation by the food company for island mission work was made.

"Between 1907 and 1913 shops and cafes were opened in Melbourne, Brisbane, and Adelaide, followed later by branches in Hobart and Perth. The manufacturing and wholesale sections of the business expanded rapidly in the period 1920-1935... In 1927 the company began to sell directly to retail grocery stores, bypassing the wholesale merchants.

"Two competing businesses were acquired in 1928 and 1929, respectively–Grain Products, manufacturers of Weet-Bix, and the Cerix Company, manufacturers of puffed cereals. These acquisitions widened and strengthened the company's activities.

"The development of the health food work in New Zealand paralleled that in Australia. Manufacturing began at Christchurch in 1900 in a small plant operated by E.C. Halsey, who had been transferred from Australia. Shops and cafes were opened in the main cities, and in 1921 a new factory was built in Christchurch under the management of A.J. Dyason. This was the beginning of an era of rapid growth, which has since continued. The Auckland and Christchurch factories of Grain Products, Ltd., were acquired in 1930. A third factory, in Palmerston North, began operation in 1952." Address: Washington, DC.

760. U.S. Department of Agriculture. 1976. The annual report on activities carried out under Public Law 480, 83d Congress, as amended, during the period July 1, 1974 through June 30, 1975. Washington, DC: U.S. Government Printing Office. See table 17.
• ***Summary:*** Table 17 is titled "Title II, Public Law 480–total commodities shipped by program sponsor, fiscal year 1975." The main program sponsors and distributing agencies, listed alphabetically, are AJJDC (American-Jewish Joint Distribution Committee), CARE, CRS (Catholic Relief Service), CWS (Church World Service), LWR (Lutheran World Relief), SAWS (Seventh-day Adventist World Service), UNICEF, UNRWA (United Nations Relief and Works Agency), and WRC (World Relief Commission). All of these are Private Voluntary Organizations (PVO/PVOs), registered with USAID. The following foods containing soy protein were distributed: Soy fortified sorghum grits (SFSG), CSM (Corn soya mix), WSB (wheat soya blend), and small amounts of soya flour. The vegetable oil which was shipped to many countries was soybean oil; it is not recorded here.

Foods containing soy protein were distributed to the following countries or areas: British Solomon Islands, India, Indonesia, Khmer Republic [Cambodia], Korea, Laos, Nepal, Philippines, Singapore, Sri Lanka, Vietnam.

Afghanistan, Egypt, Gaza, Jordan–East Bank, Jordan–West Bank, Morocco, Tunisia, Yemen.

Benin, Botswana, Burundi, Cameroon, Cape Verde, Central African Republic, Ethiopia, Gambia, Ghana, Guinea, Ivory Coast, Kenya, Lesotho, Liberia, Malagasy Republic, Mali, Mauritania, Mauritius, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia Republic, Sudan, Tanzania, Togo, Upper Volta, Zaire.

Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Peru. Address: Washington, DC. Phone: 703-875-4901 (1991).

761. *U.S. General Accounting Office, Annual Report of the Comptroller General.* 1976. Grain marketing systems in Argentina, Australia, Canada, and the European Community; soybean marketing system in Brazil. IN-76-61. 87 p. *
• ***Summary:*** In: U.S. Congress, Senate Committee on Foreign Relations–Multinational Corporations & U.S. Foreign Policy. Hearings. Part 16, p. 287-382.

762. Vermeer, J. 1976. Government policies affecting the production, marketing, and prices of soybeans. In: L.D. Hill, ed. 1976. World Soybean Research [Conference I: Proceedings]. Danville, Illinois: Interstate Printers and Publishers, Inc. xvii + 1073 p. See p. 671-83.
• ***Summary:*** Contents: World soybean production. Kinds of policies. U.S. policies. Brazilian policies. Policies of the People's Republic of China. Japanese policies. Policies of the European Community. Policies of Canada. Policies of Australia. Summary. Address: Asst. Director, Commodity Economics Div., ERS USDA, Washington, DC.

763. Wang, H.L.; Mustakas, G.C.; Wolf, W.J.; Wang, L.C.; Hesseltine, C.W.; Bagley, E.B. 1976. An inventory of information on the utilization of unprocessed and simply processed soybeans as human food. Peoria, Illinois: USDA Northern Regional Research Center, Interdepartmental Report. AID AG/TAB-225-12-76. 197 p. AID contract report. Undated. No index. 27 cm. Spiral bound. [65 ref]
• ***Summary:*** Contents: Introduction. Home and village traditional soybean foods by country. 1. Soybean food uses and production in Asia. Soaking dry soybeans. In China: Tou chiang (soybean milk; preparation, ways of serving), tou fu (soybean curd; yen-lu is the Chinese name for nigari), tou fu nao (soft curd), tou fu kan (dry / firm bean curd), chien chang (pressed tofu sheets), yu tou fu (fried tou fu), tung tou fu (frozen tou fu), tou fu pi (protein-lipid film; yuba), huang tou ya (yellow bean sprout or soybean sprout), mao tou (hairy bean, green soybean, or immature soybean), dry soybeans (roasting and frying, stewing and boiling), roasted soybean flour. Fermented soybean foods. Production and consumption of soybeans (China and Taiwan).

Japan: Tofu (soybean curd), kinugoshi tofu, processed tofu products (aburage or age, nama-age and ganmo), kori tofu (dried-frozen tofu), yaki tofu (grill tofu), yuba (protein-lipid film), soybean milk, gô (ground soybean mash), daizu no moyashi (soybean sprouts), edamame (green vegetable soybeans), whole soybeans, kinako. Fermented soybean foods: Production and consumption.

Korea: Tubu (soybean curd), soybean sprouts, whole soybeans (green soybeans, parched or roasted soybeans, boiled soybeans), soybean flour, soysauce, bean paste [Korean soybean miso], natto, production and consumption of soybeans.

Indonesia: Tahu or tahoo (soybean curd), bubuk kedele (soybean powder), tempe kedele, tempe gembus [the name in Central and East Java for okara tempeh], oncom tahu [the name in West Java for okara onchom], other soybean products (soybean sprouts, green soybeans, roasted and boiled soybeans, kecap or soysauce, tauco or bean paste [miso]), food mixtures (Saridele, Tempe-fish-rice or TFR, Soy-rice baby food, soybean residue [okara]-fish-rice), production and consumption of soybeans.

Thailand. Philippines: Soybean sprouts, soybean coffee, soybean cake (made from equal amounts of soybean flour and wheat flour), soybean milk, tou fu and processed tou fu products, production and consumption. Burma. India. Malaysia. Nepal. Singapore. Sri Lanka (Ceylon). Vietnam. West Asia [Middle East; Iran and Turkey]. References–Soybean food uses in Asia.

2. Soybean food uses and production in Africa. Ethiopia: Injera, wots and allichas, kitta, dabbo, dabokolo, porridge. Kenya. Morocco. Nigeria: Whole soybeans, soybean paste, corn-soy mixtures (soy-ogi). Tanzania. Uganda. Production. References–Soybean food uses in Africa.

3. Soybean food uses and production in Europe [both Eastern and Western]. 4. Soybean food uses and production in Latin America. Argentina. Bolivia. Brazil. Chile. Colombia. Ecuador. Guyana. Paraguay. Peru. Uruguay. Venezuela (fried arepas with textured soy). Mexico: New village process, commercial developments of soy-based food products, Gilford Harrison, Ruth Orellana, Seguras Social. Honduras. Costa Rica. Panama. Dominican Republic. Jamaica. Haiti. Trinidad. References–Soybean food uses in Latin America.

5. Soybean food uses and production in North America. United States: Oriental populations, vegetarian communes, The Farm in Tennessee. Canada. References–Soybean food uses in North America. 6. Soybean food uses in Oceania. Australia. New Zealand. 7. Summary of soybean food uses. Traditional soybean foods: Soybean milk, soybean curd and processed soybean curd products, protein-lipid film, soybean sprout, tempe (tempeh), green soybeans, boiled soybeans, roasted soybeans, soybean flour, soysauce, fermented soybean paste, fermented whole soybeans [Toushih, hamanatto], natto, fermented soybean curd. Experimental soybean foods: Whole soybean foods, soybean paste, soy flour, soy beverage. Production and consumption.

8. Recent simple soybean processes, other than traditional. Simple village process for processing whole soybeans: Equipment, process, sanitation requirements, quality of product, evaluation of product in formulas and procedures for family and institutional use in developing countries. NRRC village process. Foods from whole soybeans developed at the University of Illinois (drum dried flakes, canned and homecooked soybeans, soy beverages and beverage products, spreads, snacks).

Ways of cooking and serving soybeans in the American diet. 9. Industrial processes. Industrial production and selling prices of edible soybean protein products. 10. Barriers to acceptability and utilization of soybeans in food and research recommendations: Availability. Cultural and social factors. Texture. Flavor. Nutrition and food safety. Technology development. Technology transfer. Research recommendations [concerning each of the above barriers].

Concerning Morocco: Cereal-soy blends have been used extensively in Morocco; in fiscal year 1974 some 14.7 million lb were shipped to Morocco. Mmbaga (1975) reported that soy flour is being used in making porridge, with 1 part soy flour to 3 parts maize / corn flour.

Tables show: (1) Soybean production and imports in Taiwan, 1962-1975 (tonnes = metric tons, p. 33). Production rose from a 53,000 tonnes in 1962 to a peak of 75,200 tonnes in 1967, then fell to 61,900 tonnes in 1975. Imports skyrocketed from 62,400 tonnes in 1962 to a record 827,300 tonnes in 1975. (2) Consumption of soybean foods in Taiwan, 1964-1974 (kg/capita/year, p. 34). Total soybean foods not including tofu rose from 1.08 kg in 1964 to a peak of 2.61 kg in 1972 then fell to 1.99 kg in 1974. Consumption of tofu (80% water) rose from 18.75 kg in 1964 to a peak of 33.89 kg in 1972, then fell to 32.04 kg in 1974. (3) Supply and disposition of soybeans in Japan, 1971-1974 (p. 49). Total supply is beginning stocks, plus domestic production, and imports. Total disposition is crushing, plus traditional foods and feed. In 1974 imports accounted for 87.5% of the supply, and crushing accounted for 71.0% of the disposition. (4) Whole soybeans used in the production of traditional foods in Japan, 1970-74 (tonnes / metric tons, p. 50). Tofu and others rose from 508,000 in 1970 to 539,000 in 1974. Miso rose from 177,000 in 1970 to 192,000 in 1974. Shoyu rose from 13,000 in 1970 to 14,000 in 1974. (5) Defatted soybean meal used in the production of traditional foods in Japan, 1970-74 (tonnes / metric tons, p. 51). Shoyu rose from 163,000 in 1970 to 176,000 in 1974. Tofu and others was constant at 130,000 from 1971 to 1973. Miso decreased from 4,000 in 1970 to 2,000 in 1974. (6) Production of traditional soybean foods in Japan, 1970-74 (tonnes / metric tons, p. 52). Tofu and others rose from 1,867,800 in 1970 to 2,264,900 in 1973. Shoyu rose from 1,334,1000 in 1970 to 1,455,800 in 1974. Miso rose from 552,200 in 1970 to 587,200 in 1974. (7) Production and food use of beans [various types] and consumption of some soybean products in Korea, 1964-1967 (p. 56-57). In 1967 consumption (in tonnes / metric tons) was: Bean curd 290,000. Bean sprouts 270,000. Bean sauce 69,700. Bean paste 27,700. Total: 11.6 kg per capita per year. (8) Soybean production in Indonesia, 1960-1974 (p. 65). It rose from 442,862 tons in 1960 to 550,000 tons in 1974. (9) Consumption of soybeans in various parts of Indonesia in 1970 (p. 66). (10) Production of soybean foods in the province of Central Java, 1968-1972 (tons, p. 67). Kecap rose from 914,695 in 1968 to 1,524,000 in 1972. Tahu decreased from 18,570 in 1978 to 17,000 in 1972. Tempe rose from 506 in 1968 to 39,000 in 1972. (11) Area planted to soybeans and total soybean production in Thailand, 1964-1974 (p. 70). Area rose from 213,000 rais (6.25 rais = 1 ha) in 1964 to 1,016,000 rais in 1974. Production (in metric tons) rose from 31,300 in 1964 to 252,400 in 1974. (12) Utilization of soybeans by soybean-consuming countries, 1964-66 (based on FAO 1971 Food Balance Sheets, 1964-66 average, p. 150). The countries leading in per capita consumption (kg/person/year) are: China (PRC) 6.7. Japan 5.1. Korea(s) 5.0. Singapore 4.3. Indonesia 2.8. Malaysia 2.6. Taiwan (ROC) 1.1. (13) Amounts of cereal-soy blends distributed under Title II, Public Law 480 in fiscal year 1974 (p. 152-155). (14) U.S. exports of full-fat soy flour, 1974-75 (p. 156).

Note: This is the earliest English-language document seen (Feb. 2004) that uses the word "tubu" to refer to Korean-style tofu. Address: Northern Regional Research Center, Agricultural Research Service, Department of Agriculture, Peoria, Illinois 61604.

764. Muso Shokuhin. 1976? Distributors of Muso foods in Canada, South America, Europe, and Australia (Leaflet). Osaka, Japan. 1 p. Undated.
• ***Summary:*** The name, address, and phone number of each company is given. Canada: Lifestream Natural Food, Inc. (British Columbia). Manna Foods, Inc. (Ontario).

South America: Zentro Macrobiotico de Venezuela.

Europe: Societe Traplun (France). Unimave S.C.A.R.L. (Portugal). Urtekram (Denmark). V.Z.W. Voedselcollektief (Belgium). Manna (Holland). Centro Dietetico Macrobiotico Italiano (Italy). Centro Macrobiotico Italiano (Italy). Harmony Foods (England). Kameo (France). P.V.B.A. Lima (Belgium). Moder Jord & Söner (Sweden). Reformhaus Rahlstedt (West Germany). Schwarzbrot (West Germany). Dr. Naturopata SER (Spain). Eduardo Galamba De Sa Pires (Portugal).

Australia: True Health Aides Pty. Ltd. (Sydney). Address: 1-43 Otedori, Higashi-ku, Osaka, Japan. Phone: (06) 945-0511.

765. King, Neville L. 1977. Heat-induced complex formation between myosin and soybean 7S globulins. *J. of Agricultural and Food Chemistry* 25(1):166-71. Jan/Feb. [22 ref]
• ***Summary:*** Myosin (extracted from the muscles of rabbits) and β-conglycinin (a soybean 7S globulin fraction) were found to associate after exposure to temperatures in the range 75-100ºC. Address: CSIRO Div. of Food Research, Meat Research Lab., Cannon Hill, Queensland 4170, Australia.

766. Romano, I.; Kerr, J.C. 1977. Soybeans in the Central and Upper Burnett [Australia]. *Queensland Agricultural Journal* 103(1):64-67. Jan/Feb.
• ***Summary:*** "High-yielding varieties and an increase in prices have made soybeans increasingly popular in the Central and Upper Burnett. Since 1971, the area sown has increased from trial areas to over 500 hectares at Monto and 860 hectares around Gayndah and Mundubbera for the 1974-75 crop." Address: Agriculture Branch [Dep. of Primary Industries, Brisbane, Australia].

767. Shorter, R.; Byth, D.E.; Mungomery, V.E. 1977. Estimates of selection parameters associated with protein and oil content of soybean seeds (Glycine max (L.) Merr.). *Australian J. of Agricultural Research* 28(2):211-22. March. [16 ref]
• ***Summary:*** Three soybean crosses were grown at two locations, one near the coast, the other on the Darling Downs. The protein, oil, and protein plus oil content of each cross was studied. Address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld 4067. Mungomery's present address: Queensland Dep. of Primary Industries, Research Station, Biloela, Qld. 4715.

768. Stephenson, R.A.; Wilson, G.L. 1977. Patterns of assimilate distribution in soybean. I. The influence of reproductive development stage and leaf position. *Australian J. of Agricultural Research* 28(2):203-09. March. [11 ref]
Address: Dep. of Agriculture, Univ. of Papua New Guinea, Port Moresby, P.N.G..

769. *INTSOY Newsletter (Urbana, Illinois).*1977. Asia-Oceania soybean rust workshop. No. 11. p. 1. May.
• ***Summary:*** "Soybean rust poses a serious economic threat to soybean production areas, particularly in the Eastern Hemisphere [Asia] A systematic, coordinated research program is urgently needed for many of the Asian and Oceanian countries where the disease occurs. The first workshop on soybean rust was convened in Manila, the Philippines, from Feb. 27 through March 4, 1977, to organize such a program. The workshop was cosponsored by the Asian Vegetable Research and Development Center (AVRDC), the Philippine Council for Agriculture and Resources Research (PCARR), and INTSOY."

More than 30 participants attended. Five program recommendations are given.

770. Reboul, Jean-Louis; Yau, R. 1977. Culture du soja en Polynesie francaise [Soybean cultivation in French Polynesia]. *Polynesie Francaise, Service de l'Econmie Rurale, Recherche Agronomique [Pirae, Tahiti].* May. 10 p. [Fre]*
• ***Summary:*** In a soybean variety trial, the highest seed yields were from Davis, Forrest, Bossier, and Calland.

771. Reboul, Jean-Louis; Yau, R. 1977. Culture du soja en Polynesie francaise [Soybean cultivation in French Polynesia]. Pirae, Tahiti: Polynesie Francaise, Service de l'Economie Rurale, Recherche Agronomique. 10 p. May. [Fre]*

• ***Summary:*** In a soybean variety trial, the highest seed yields were from Davis, Forrest, Bossier, and Calland.

772. Stephenson, R.A.; Wilson, G.L. 1977. Patterns of assimilate distribution in soybean. II. The time course changes in carbon-14 distribution in pods and stem sections. *Australian J. of Agricultural Research* 28(3):395-400. May. [6 ref]
Address: Dep. of Agriculture, Univ. of Papua New Guinea, Port Moresby, P.N.G. [Papua New Guinea].

773. *ASEAN Protein Project Newsletter.* 1977. Serial/ periodical. Bangkok, Thailand: Office of the Chairman of the ASEAN Sub-Committee on Protein. No. 1, Aug. 1977. Editor: Prof. Amara Bhumiratana.
• ***Summary:*** The 5 ASEAN nations are Indonesia, Malaysia, Philippines, Singapore, and Thailand. Address: Inst. of Food Research and Product Development, Kasetsart Univ., Bangkok, Thailand.

774. Yang, Charles Y. 1977. Past and present studies on soybean rust incited by *Phakopsora pachyrhizi* Syd. *Bulletin of the Institute of Tropical Agriculture, Kyushu University* 2:78-94. Aug. Reprint monograph at NAL. [30+ ref. Eng]
• ***Summary:*** "Soybean rust, caused by *Phakopsora pachyrhizi* Syd., is the most serious soybean disease in Asia and Australia and is a potential threat to other soybean production regions." Address: Kyushu Univ., Japan.

775. *Soybean Digest.* 1977. What is the competition up to? Sept. p. 14h-14j, 14l.
• ***Summary:*** Discusses the grain (mostly wheat) and oilseed (mostly soybean) marketing systems in the following countries (summarized from a report by the U.S. Comptroller General's office): Canada, Australia, Argentina, Brazil, and the European Community.

Brazil currently produces about one-third as many soybeans as the USA. Cooperatives dominate the national marketing system in Brazil. Though the government has set minimum price levels (announced 2 months before planting time) high enough to guarantee producers a profit, world prices have been such that support prices have been unnecessary. Credit is available from the government up to 80% of the support price. Even though Brazil's export and domestic soybean trade is in private hands, the government exercises strong regulatory power over the trade.

"The European Community was first formed in 1957 with Germany, France, Italy, Belgium, The Netherlands and Luxembourg agreeing to integrate their agricultural community programs. In 1973, Denmark, Ireland and the United Kingdom also became members.

"The agricultural goal for the European Community is to stabilize commodity prices at levels that afford producers fair returns while assuring adequate supplies at reasonable prices for consumers. It is nearly impossible to have an agriculture program that will satisfy both producers and consumers; in the European Community countries the bias is in favor of the producer. There are many complaints by consumers that the price supports are too high, the program too costly and that the program fosters inefficient production. The domestic price is protected by levies and duties on imports.

"The agriculture policy is financed through a European community guarantee fund financed by the levies and duties collected and by assessments... The European Community, even with the intra-European Community trade, still imports about 25% of its agricultural commodities and products. The European Community is the largest importer of agricultural commodities in the world and the largest U.S. customer."

776. *Sun (The) (Melbourne, Australia).* 1977. Deaths–Roberts. Oct. 18. p. 73.
• ***Summary:*** "On Oct. 17 after a long illness, at Nunawading [about 20 miles east of Melbourne, Victoria, Australia]. Fred. Beloved husband of Gladys. Loved father of Fred (dec. [deceased]), Horace (dec.), and Gladys (Mrs. Hawken)."

Note from Leeann Erickson, his great granddaughter. 2007. Oct. 8. F.G. Roberts died while a resident at Coronella Nursing Home in Nunawading; it is one of the Seventh-day Adventist Retirement Homes in and around Melbourne.

777. Kidby, D.K.; McComb, J.R.; Snowdon, R.L.; Garcia-Webb, P.; Gladstones, J.S. 1977. Tempeh production from *Lupinus angustifolius* L. Paper presented at Symposium on Indigenous Fermented Foods, Bangkok, Thailand. Summarized in K.H. Steinkraus, ed. 1983. Handbook of Indigenous Fermented Foods. New York: Marcel Dekker, Inc. ix + 671 p. See p. 54-56.
• ***Summary:*** Tempeh was prepared successfully from sweet lupin. Address: Dep. of Agricultural Microbiology, Univ. of Western Australia, Crawley, Western Australia.

778. McComb, John. 1977. A study of the use of sweet lupins in tempeh, an Oriental food fermentation. Bachelor of Agricultural Science thesis, University of Western Australia. xi + 127 p. Nov. Illust. with 9 color photos. No index. 30 cm. [130 ref]
• ***Summary:*** Excellent review of the literature. Contents: List of tables, figures, plates. I. Introduction. II. A literature review: 1. A context for food research. 2. Microbiology of tempeh production. 3. Nutritional characteristics of tempeh. 4. New fermented food products. 5. Food uses of lupins. III. Experiments: 1. Culture preparation and preservation. 2. Preparation of lupins for fermentation and collective observations. 3. Tempeh fermentation: Inoculum potential

for lupin tempeh production. 4. Energy content of lupin tempeh. 5. Human feeding test with lupin tempeh. 6. Consumer taste response survey. IV. Conclusions. References. Appendixes: 1. Yeast malt extract agar. 2. Blood and urine analysis. Daily diet. 3. Solids and energy losses during tempeh fermentation procedures. Address: Univ. of Western Australia.

779. Barkla, F.J.; Pritchard, K.E. 1977. Irrigated soybeans for northern Victoria. Kyabram, Victoria, Australia: Irrigation Research Station, Dept. of Agriculture. 13 p. 26 cm. *
Address: Kyabram, Victoria, Australia.

780. Holland, J.F. 1977. Grain legumes in Northern New South Wales. *Australian Field Crop Newsletter* No. 12, p. 41-43. *

781. Khan, T.N. 1977. Grain legumes in Papua New Guinea. In: Induced Mutations for the Improvement of Grain Legumes in South East Asia (1975): Proceedings of a South East Asia Regional Seminar Organized by the Joint FAO-IAEA Division of Atomic Energy in Food and Agriculture: Vienna, Austria: International Atomic Energy Agency. See p. 99-102. Held 8-13 Dec. 1975 at Colombo, Sri Lanka. *
• ***Summary:*** More than 100 soybeans have recently been introduced into Papua New Guinea. Mutation breeding is in progress using the winged bean *(Psophocarpus tetragonolobus)* with the goal of producing a mutant with a bushy type of growth habit. Address: Univ. of Papua New Guinea.

782. Maneephong, C.; Nilapun, S. 1977. Heritability and correlation of agronomic characters in soybeans. In: Third International Congress of SABRAO, Canberra, Australia. See p. 22-25. Held Feb. 22-28. *
• ***Summary:*** SABRAO stands for the "Society for the Advancement of Breeding Research in Asia and Oceania." SABRAO has strong links with the International Rice Research Institute (IRRI), Manila, Philippines.

783. Bergersen, F.J. 1977. Factors controlling nitrogen fixation by rhizobia. In: A. Ayanaba and P.J. Dart, eds. 1977. Biological Nitrogen Fixation in Farming Systems of the Tropics. New York, NY: Wiley and Sons. xi + 377 p. See p. 153-65. Chap. 13. Based on papers presented at a symposium held at the International Institute of Tropical Agriculture, Ibadan, Nigeria, in October 1975. [35 ref]
• ***Summary:*** "Summary: An outline is given of the development and properties of the nitrogen-fixing tissues of legume-root nodules and of physiological factors controlling nitrogenase activity in nodules,..." Address: Div. of Plant Industry, CSIRO, Canberra, Australia.

784. Date, R.A. 1977. The development and use of legume inoculants. In: A. Ayanaba and P.J. Dart, eds. 1977. Biological Nitrogen Fixation in Farming Systems of the Tropics. New York, NY: Wiley and Sons. xi + 377 p. See p. 169-80. Chap. 14. Based on papers presented at a symposium held at the International Institute of Tropical Agriculture, Ibadan, Nigeria, in October 1975. [16 ref] Address: Div. Tropical Agronomy, CSIRO, Cunningham Lab., St. Lucia, Queensland 4067, Australia.

785. Dilworth, M.J.; McComb, J.A. 1977. Recent advances in tissue-culture studies of the legume-*Rhizobium* symbiosis. In: A. Ayanaba and P.J. Dart, eds. 1977. Biological Nitrogen Fixation in Farming Systems of the Tropics. New York, NY: Wiley and Sons. xi + 377 p. See p. 135-49. Chap. 11. Based on papers presented at a symposium held at the International Institute of Tropical Agriculture, Ibadan, Nigeria, in October 1975. [19 ref]
• ***Summary:*** "Summary: The complexity of nodular plant–*Rhizobium* symbiosis led to attempts to use a simplified system of undifferentiated plant callus cultures inoculated with *Rhizobium*. Nitrogenase production at a low level was shown together with an apparent infection of soybean cells with rhizobia and bacteroid production." Address: School of Environmental and Life Sciences, Murdoch Univ. Murdoch, Western Australia, Australia.

786. Flora of Taiwan Committee. 1977. Flora of Taiwan. Vol. III. Angiospermae. Taipei, Taiwan: Epoch Publishing Co. 1000 p. See p. 293-98. [12 soy ref. Eng]
• ***Summary:*** There are about 10 species of Glycine distributed in Africa, Asia and Australia; five in Taiwan. Those found in Taiwan are as follows; the Chinese characters, a botanical description, and an illustration are given for each: 1. *Glycine clandestina* Wendl. (Beobacht. 54. 1798). Distributed in Australia and mainland China. Found in Taiwan in open grasslands by the seashore.

2. *Glycine javanica* L. Sp. Pl. 754. Distributed in India, Ceylon, Malaysia and Java. Cultivated in Taiwan.

3. Glycine max (L.) Merr., Interp. Herb. Amb. 274. 1917.

4. Glycine soja Sieb. & Zucc. Distributed in mainland China and Japan. Cultivated in Taiwan.

5. *Glycine tomentella* Hayata, Icon. Pl. Form. 9: 29, 1920. Distributed in southern China, the Philippines and Australia. Found in Taiwan in open fields.

787. Hymowitz, T.; Newell, C.A. 1977. Current thoughts on origins, present status, and future of soybeans. In: David S. Seigler, ed. 1977. Crop Resources. New York: Academic Press. xi + 233 p. See p. 197-209. Proceedings of the 17th annual meeting of the Society for Economic Botany, held

13-17 June 1976 at the University of Illinois, Urbana. [56 ref]

• ***Summary:*** Contents: Current thoughts on origins and the introduction of the soybean into the United States (Paillieux, Compte du Buffon [Comte de Buffon], Benjamin Franklin, Dr. James Mease, A.H. Ernst of Ohio, William H. Stoddard of Illinois; Contains a good early history of soybeans in Illinois). Present status of the soybean–Breeding and germplasm resources. The future–Exploitation of the genus *Glycine* (incl. wild perennial soybeans in Australia).

"Benjamin Franklin was the American Ambassador to France from 1778 to 1785. He befriended Compte [sic, Comte] de Buffon and arranged for seed exchanges between the two countries... In 1787, Buffon wrote a letter to Franklin in Philadelphia, Pennsylvania, acknowledging the seeds and rare plants sent to him from the United States. In 1780, a letter written to Franklin's grandson William Temple Franklin from de Malsherbes in Paris mentions the shipment of three packages of seeds of plants unknown in the United States. The seed introduced from France was shipped to Philadelphia and planted in the botanic garden" there.

The first citation seen for the soybean in the Midwest is by A.H. Ernst of Cincinnati, Ohio (See *Report of the Commissioner of Patents, Agriculture,* 1853, page 224). He referred to the plant as "The Japan Pea," and said it was "of Japan origin, having been brought to San Francisco [California] about three years since and thence to Illinois and Ohio." Address: Crop Evolution Lab., Dep. of Agronomy, Univ. of Illinois.

788. Johns, Yohanni. 1977. Dishes from Indonesia. New metricated edition. Melbourne, Australia: Thomas Nelson (Australia) Ltd. xiv + 151 p. Illust. Index. 26 cm. 1st ed. 1971.

• ***Summary:*** The author comes from a town in Indonesia named Padang Pajang, located in the mountains of West Sumatra in an area known as Minangkabu. The society is matrilineal, so ancestral property is passed down the female line and a new husband comes to live in his wife's family's home. She married an Englishman in about 1955 and they lived in Jogjakarta (in Central Java) from 1956-1958, then in Australia since 1958.

This handsome book, packed with color photos, gives a good introduction to Indonesian cookery–though it contains a disproportionate number of recipes using meat. The excellent glossary of ingredients (p. 10-16) includes: Bean curd (incl. fried bean curd), black bean sauce or salted black beans *(tauco,* sic. Note: *tauco* is Indonesian-style miso, whereas *taosi* is salted black beans; which does she mean?), and soya sauce. Note that tempeh is not mentioned. Soy-related recipes include: Eggs in soya sauce (p. 53-54). Fried fish in black bean sauce (Tauco ikan, p. 60). Stir-fried prawns with long beans and black bean sauce (p. 71). Bean curd balls with prawns (p. 72). Braised liver in soya sauce (p. 86). Braised ox tongue in soya sauce (p. 87). Braised chicken in soya sauce (p. 90). Sambal of brown bean sauce (p. 101). Soya sauce sambal (Sambal kecap, p. 102). Fried soya bean curd with sauce (p. 125). Address: Australia.

789. Lackey, James A. 1977. A synopsis of the Phaseoleae (Leguminosae, Papilionoideae). PhD thesis, Iowa State University, Ames, Iowa. *

• ***Summary:*** Both "the subgenus *Glycine* and the subgenus *Soja* are probably derived from *Pueraria*-like ancestors in tropical Asia. From this tropical center, species in the subgenus *Glycine* have successfully invaded Australia and associated areas, and the wild form in the subgenus *Soja* has invaded central and northern Asia."

Pueraria is the second largest genus in the subtribe *Glycininae* Benth.

790. Materon, Luis Alberto. 1977. Host specificity and inter-strain competition with soybean rhizobia. Thesis, Sydney, Australia. *

• ***Summary:*** With an appendix on: The influence of fungicides on the nodulation of soybeans under glasshouse and field conditions. Address: Sydney, Australia.

791. Phillips, Ann Vroom; Phillips, David A. 1977. From the new world of Australia... the soil to psyche recipe book: Delightful new recipes for new age living... plus a total plan for zestful vegetarian nutrition from the bright new world down under! Santa Barbara, California: Woodbridge Press Publishing Co. 143 p. Recipe index. 16 x 23 cm.

• ***Summary:*** Cover title: "The soil to psyche recipe book." Soy-related recipes include: Darling Downs soya loaf (p. 48-49; "The Darling Downs produce some of the most beautiful organically grown soya beans in the world, on the softly rolling fertile hills. The extremely high fertility is due to the great depth of rich topsoil–five feet or more in many places. The location in subtropical southern Queensland provides the ideal climate for Australia's soya bean crops").

Chulora soya cheese (p. 49-50; Australian aborigines used 2 flat stones to grind seeds and beans into flour that they called "chulora." The authors grind soybeans into superfine soya flour, which they use to make tofu [though the word "tofu" is not used], curded with lemon juice. Into the well-drained curds they mix and mash finely chopped bell pepper and celery tops or parsley, press into a chosen mold, then refrigerate before serving).

792. The Australian encyclopedia. 3rd ed.: Soybean. 1977. Sydney, New South Wales: The Grolier Society of Australia, Pty., Ltd. See vol. 5. p. 392-93. [2 ref]

• ***Summary:*** "In New South Wales, experience with the crop began about 1915. Some hundreds of varieties have been imported, mainly from the United States, but also from other countries. Particularly in the eastern States of Australia there has been extensive research into varieties, cultural practices, fertilisers, seed inoculation and so on. The success of the soybean industry in the United States led to the visit to that country in 1946 of an Australian Mission of Investigation... Between 1944 and 1951 the CSIRO introduced and tested many varieties from 18 countries. This programme lapsed, however, as did attempts at commercial production.

"In the early 1960s New South Wales and Queensland re-established soybean investigations and research. By 1968/9 soybean was attracting commercial attention. In that season 2,093 hectares produced 1,740 tonnes of soybeans. In the 1970s some 70,000 tonnes were produced annually from 53,000 hectares sown. In New South Wales almost all the crop is irrigated, whereas in Queensland much of the crop is produced without the aid of irrigation." Address: Sydney, NSW, Australia.

793. Vincent, J.M.; Whitney, A.S.; Bose, J. eds. 1977. Exploiting the legume-Rhizobium symbiosis in tropical agriculture. *College of Tropical Agriculture (Univ. of Hawaii), Miscellaneous Publication* No. 145. xiv + 469 p. Proceedings of a workshop held at Kahului, Maui, Hawaii, Aug. 23-28, 1976, under the auspices of the University of Hawaii NifTAL Project. [200+ ref]

• ***Summary:*** Contents: Preface (NifTAL, founded by USAID in 1975 at the University of Hawaii's College of Tropical Agriculture, stands for "Nitrogen Fixation by Tropical Agricultural Legumes." It is based on Biological Nitrogen Fixation, or BNF). Workshop participants. Foreword. Twenty-five chapters by various authors. Group discussions (summary).

Soybeans are discussed mainly in one chapter in this book: "Inoculation of soybeans," by J.R. Jardim Freire of Brazil (p. 335-79, which see). They are also mentioned in several other chapters: "An analysis of the role of legumes in multiple cropping systems," by A.A. Gomez and H.G. Zandstra (p. 81-95; see p. 84, 86-87, 91). Also: 98, 103, 145, etc. Unfortunately, this book has no index. Address: 1. Univ. of Sydney [Australia]; 2. Univ. of Hawaii; 3. Univ. of Hawaii NifTAL Project.

794. Edwards, R.A. 1978. Social and legislative constraints [on soy protein foods]: The Australian situation. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 12-13.

• ***Summary:*** There are somewhat less than 200,000 vegetarians in Australia, mostly Seventh-day Adventists, Hindus, and Jains. Their dietary needs have been met for the last 40 years by the Sanitarium Health Food Company, which is owned by the Adventist Church. Their meatlike products include Nutmeat, Rediburgers, Vegecuts, and Vegelinks. Initially the protein in these foods came exclusively from nuts, then wheat gluten was added, and more recently they have also included low-fat soy flour imported from the USA. The company imports texturized soy protein products and also makes their own, but they have found that their traditional untexturized vegetable protein foods outsell TVP by a factor of 50 to 1. Sanitarium appears to be the only supplier of non-meat protein foods to Australian and New Zealand consumers, presumably because the market is not big enough to attract a second company of the type.

As far as the author knows, the only Australian manufacturer of TVP other than Sanitarium is Griffith Laboratories, which makes an unflavored TVP for the very large and lucrative pet food market; they also make a low-fat soy flour.

In Australia, heart disease is the most serious disease, accounting for more than 30% of all deaths. With health professionals advocating a reduction in animal products, total fats, saturated fats, and cholesterol, and with the increasing awareness during the last few years of the relation between nutrition and health, "it would seem to me to be an opportune time to give the marketing of soy bean products a deeper and more searching examination than the superficial approaches that have been taken in the past." Address: Prof., School of Food Technology, Univ. of New South Wales, P.O. Box 1, Kensington 2033, Australia.

795. Villa-Abrille, Carlos. 1978. Marketing of extended meat products in Third World countries. In: American Soybean Assoc., ed. 1978. International Soya Protein Food Conference, Proceedings. Hudson, Iowa: ASA. 136 p. See p. 110-15. [1 ref]

• ***Summary:*** Contents: Statement of the problem. Applications. Case studies: Ralston Purina (reasons for developing the product, quantification and qualification of demand, determination of product type and form, communicating the value, conclusion), Pure Foods Corporation (reasons for developing the product, quantification and qualification of demand, conclusion). Summary.

Per capita consumption (kg/person) of total red meat in specified countries in 1975, in descending order of amount is: Uruguay 104, Australia 101, Argentina 98, New Zealand 95, United States 83, Canada 73, Belgium-Luxembourg 73, West Germany 68, France 67, United Kingdom 57, USSR 45, Taiwan 20, Japan 16. Address: Pure Foods Corp., Manila, Philippines.

796. Newell, C.A.; Hymowitz, T. 1978. A reappraisal of the subgenus *Glycine*. *American J. of Botany* 65(2):168-79. Feb. [45 ref]

• ***Summary:*** "The genus *Glycine* Willd, is divided into 3 subgenera, *Glycine* Willd., *Soja* (Moench) F.J. Herm., and *Bracteata* Verdc. Six species are currently recognized in the subgenus *Glycine: G. canescens* F.J. Herm., *G. clandestina* Willd., G. *falcata* Benth., *G. latrobeana* (Meissn.) Benth., *G. tabacina* (Labill.) Benth., and *G. tomentella* Hayata. Distribution of the subgenus extends from south China to Tasmania an includes several Pacific islands. A collection of these species was examined cytologically and morphologically..."

"*Bractea* is composed of *G. wightii* (R. Grah ex Wight & Arn.) Verdc., a highly variable perennial species distributed throughout Africa and parts of southeastern Asia. Verdcourt (1966 [in Taxon]) has partitioned *G. wightii* into three subspecies and four varieties. The subgenus *Glycine* includes six perennial species with a wide distribution ranging from south China to Tasmania and eastwards to the Pacific islands of Tonga.

"Considerable confusion has surrounded the taxonomy of the genus *[Glycine]* at every stage in its history. Linnaeus originally introduced the name *Glycine* in 1737 in the first edition of his Genera Plantarum and based it on *Apios* Boerhaave. *Glycine* is derived from the Greek work *glykys*, meaning sweet, and probably refers to sweetness of the edible tubers found in *Apios* Boerhaave or *Glycine apios* (L.), now known as *Apios americana* Medik. (Henderson, 1881, 1910). Eight *Glycine* species were listed in the Species Plantarum (Linnaeus, 1753), but subsequently these were all transferred to other genera with the exception, for some time, of *Glycine javanica* L.... Hermann reduced the size of the genus from 286 species to 10, primarily by excluding all those species which belonged to other genera. The only remaining Linnaean *Glycine, G. javanica* L., had been retained earlier as the lectotype for the genus (Hitchcock and Green, 1947).

"Further revision became necessary when Verdcourt (1966) discovered that Linnaeus' description of *G. javanica* was based upon a specimen of *Pueraria.* In order to avoid major alterations in genera which included several agriculturally important legumes, Verdcourt proposed that the name *Glycine* be conserved from a later author, Willdenow (1802). Thus *G. clandestina* Willd. became the type for the genus and *G. javanica* L. was transferred to *Pueraria montana* (Lour.) Merr. *Glycine wightii* was introduced as a new species combination for all those populations previously interpreted as *G. javanica."* Address: Dep. of Agronomy, Univ. of Illinois at Urbana-Champaign, Urbana 61801.

797. Johns, Yohanni. 1978. Re: Thoughts on The Book of Tempeh manuscript. Letter to William Shurtleff at New-Age Foods Study Center, May 15. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "Your book should have been published many years ago. It will be a hit even in Indonesia... I am from Central Sumatra, thus, there are many recipes that I have never seen before. Moreover, in Central Sumatra, where much more meat is eaten than in Java, people tend to look down on tempeh. In fact, I seldom ate tempeh until I made my first visit to java at the age of twenty.

"Your recipes are fascinating... There is however, one important point: the making of tempeh making residual press-cake from sun-dried coconut is now banned in Indonesia. It may be lethal!"

Note: Yohanni is a well-known cookbook author. See *Dishes from Indonesia* (1977). Address: Lecturer, Dep. of Indonesian Languages and Literatures, Faculty of Asian Studies, The Australian National Univ., Box 4, P.O., Canberra, A.C.T.,.

798. Cross, Leslie. 1978. Free plant milk. *Alive (England).* May. p. 6.

• ***Summary:*** "The Australian Govt. as long ago as 1965 empowered doctors to prescribe–at subsidised rates–soya milk to any child considered reactive to cowmilk..." Wander Pharmaceuticals made the first British plantmilk, Velactin. The Plantmilk Society, formed in 1956, is a Registered Charity. Address: Secretary, The Plantmilk Society, Uxbridge, England.

799. Hicks, P. Alastair. 1978. ASEAN full fat soy flour produced for first time! Start up for full fat soy flour factory, Chieng Rai, Thailand. *ASEAN Protein Project Newsletter* No. 3. p. 3-5. May.

• ***Summary:*** The first full-fat soy flour was produced here on 27 April 1978. The following equipment is used in processing the beans: Food hopper, grain cleaner, de-stoner, clean bean storage, fluidized bed debittering, cracking mill, hull cleaner, hull removal, turbo mill (Buehler). Address: Australia.

800. People attending the foundation meeting of the Soycrafters Association of North America, July 28-30, 1978, Ann Arbor, Michigan. 1978. Ann Arbor, Michigan. 3 p. Unpublished typescript.

• ***Summary:*** This is a typed list of the names, addresses, and (in some cases) phone numbers of the 69 people who attended this landmark meeting. 1. Doug Morris, Tucson Tofu, 1716 E. Factory Ave., Tucson, Arizona 85716, 602-624-7741. 2-4. Susan Kalen, Jerry MacKinnon & Steve Fiering, The Soy Plant, 211 E. Ann St., Ann Arbor, Michigan. Phone: 313-663-0500. 5-6. Carol Ann & Timothy Huang, Yellow Bean Trading Company, 4414 Buckingham, Detroit, Michigan 48224.

7. Dick Moore, Miller/Moore Apiaries, P.O. Box 171, Martindale, Texas 78655. 8-9. Pat & Jay Gibbons, Crystal Hills Tofu Shop, 1 Jefferson St. Box 752, Bethlehem, New

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Hampshire 03574. Phone: 603-869-2677. 10. Robin Mallor, 848 Tappan St. #20, Ann Arbor, Michigan 48104. 11. Randall Yamauchui, Hinode Tofu, 526 S. Stanford Ave., Los Angeles, California 90504.

12. Elizabeth Martin, Claymont Society [Happy Dragon Tofu], Box 112, Charleston, West Virginia 25414. Phone: 304-725-4437. 13-14. Pam Sharp & Greg Murphy, 52 Prospect Ave., Sea Cliff, New York 11579. 15-16. Herschel & Carmen Cook, 8521 Lotus, Skokie, Illinois 60077.

17. Yoshiharu Uchida, 6825 N. Sheridan Rd., Chicago, Illinois. 18. Rebecca Miller, 7467 N. Marshfield, Chicago, Illinois. 19. Wataru Takai, Takai Seisakusho, 5-65 Yokogawa, Kanazawa, 921 Japan. 20. Zeev Steven Berg, 570 Montgomery Street, Brooklyn, New York 11225.

21-23. Barbara Stutz & Rob Davis & Kay Thorbeck, (In the process of naming our shop), 8745 S. Rockport Road, Bloomington, Indiana 47401. 24. Steven Heller, 160 East 88th St., New York, New York 10028. 25. Ken Lee, Toy Enterprise, 658 N. Broadway, Los Angeles, California 90012. 26. Mary Lee Purrington, 225 Rose Ave., Salem, Ohio 44460.

27. Bob Barbarite, Hashizume Foods, 5th Floor Front 33 Union Square West, New York, New York 10003. 28. Rodney Yamauchi, Aala Tofu, 513 Kaaahi St., Honolulu, Hawaii 96813. 29. Bill Shurtleff, P.O. Box 234, Lafayette, California 94549. 30-31. Tim Waters & Terrie Rogers, Celebration Tofu, Bellingham Tofu Works, 2112 J. St., Bellingham, Washington 98225, 206-676-1989.

32. Steve Demos, White Wave Tofu, 1738 Pearl, Boulder, Colorado 80302. 33. John Stielstra, Morning Glory Alley, Inc., 1214 Regent St., Madison, Wisconsin 53715. 34. John Shiflett, Pippins Inc., 8405 Holly St., Laurel, Maryland 20810. 35-36. Andy Schecter & Greg Weaver, The Tofu Shop, 277 N. Goodman St., Rochester, New York 14607.

37-39. JoAnn Yoshimoto & Verena Krieger & Brian Schaefer, It's Natural, 502 Main St., Evanston, Illinois 60202. 40. Kathryn Bennett-Clarke, Southwest Tofu, Rt. 2 Box 234, Santa Fe, New Mexico 87501. 41. Amy Pincus, Magic Bean Co-op., 3227 N. Humboldt Ave., Milwaukee, Wisconsin 53212.

42. Chico Wagner, Mantis Organics, 9409 Cameron Rd., Austin, Texas 78753. 43-45. Denise Alexander & Les Karplus & Dave Parker, Vegetarian Inc., 132 S. Market, Champaign, Illinois 61820, 217-359-8843. 46. Jim Wilks, Swan Food Corp., 5758½ Bird Rd., Miami, Florida 33155, 305-667-7141. 47-48. Don Nicolson & Sue White, New Day Tofu Products Inc., 5912 Liberty Rd., Baltimore, Maryland 21207, 301-944-4673 & 301-655-0854.

49-50. Jamie Stunkard & Pat Aylward, Joy of Soy, 1307 2nd Ave., Minneapolis, Minnesota 55405, 612-374-3184, 612-379-2390. 51. John Seed, Bodhi Farm, The Channon, N.S.W. 2480, Australia. 52-53. Lora Mermin & Chris Burant & Deborah Backman, Madison Tofu Co-op, 903 Williamson St. Madison, Wisconsin 53703, 608-251-0595. 54. Steve Heidenry, Magic Bean Co-op, 3046 N. Cambridge St., Milwaukee, Wisconsin 53211.

55. Ed Brown, Magic Bean, 2463 N. Booth St., Milwaukee, Wisconsin 53212. 56. Benjamin Hills, Surata Soyfoods, 518 Olive Street, Eugene, Oregon 97401, 503-485-6990. 57. Larry Needleman, Bean Machines, Inc., P.O. Box 76, Bodega, California 94922. 707-876-3341.

58-59. Carol & John Hargadine, Nupro Foods/Soywaze Tofu, 1227 City Park Ave., Fort Collins, Colorado 80521. 60. Jack Mizono, Azumaya Inc., 95 Boutwell St., San Francisco, California 94124. 61. Dan Burke, Pacific Soybean & Grain Ltd., 495 De Haro St., San Francisco, California 94107. 62. George Hanley, 4425 Charles St., Dearborn, Michigan 48126, 581-7343. 63. Dan Tucker, 854 Hawkeye Park, Iowa City, Iowa 52240, 319-354-1250.

64. Paul Beeson, 207 N. Acacia St., Solona Beach, California 92075, 714-481-6914. 65. Keith Almeida, 26 W. Main St., Clinton, Connecticut. 66. Jean Huffman, P.O. Box 444, Lecanto, Florida 32661.

67-68. Keith Hintz & Dave Koressel, Magic Bean Co-op, 2234-A N. Booth, Milwaukee, Wisconsin 53212, 414-374-2873. 69. Tom Timmins, New England Soy Dairy Inc., 305 Wells Street, Greenfield, Massachusetts 01301.

801. Possingham, R.E. 1978. Obituary: Roberts. *Australasian Record and Advent World Survey (SDA, Warburton, Victoria, Australia).* Aug. 1. p. 15.
• ***Summary:*** "Just one day before her eighty-third birthday, on July 12, 1978, at St. Michael's Hospital, Murrumbeena [a small suburb in Melbourne, to the south east], Victoria, Gladys Maude Roberts fell asleep in Jesus. Born on July 13, 1895, this dear woman lived a life that was rich and full, a life that was spent in the interests of others. It mattered not whether it was a neighbor, a patient at the clinic, a member of the church or her Sabbath school class, she was always available to them. She is predeceased by her husband and two sons, Fred and Horace, but leaves a daughter, Mrs. Gladys Hawken. To her and the grandchildren, we extend our deepest sympathy. With you, we await the coming of our Christ." Address: Australia.

802. Whigham, D.K.; Judy, W.H. 1978. International soybean variety experiment: Third report of results, 1975. *INTSOY Series* No. 15. x + 369 p. Aug. (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** In the ISVEX trials, soybeans were tested in the following regions and countries: Africa: Algeria, Burundi, Cameroon, Congo, Dahomey, Egypt, Ethiopia, Gambia, Ghana, Ivory Coast, Lesotho, Mali, Mauritius, Niger, Reunion, Rhodesia (Salisbury), Rwanda, Senegal, Sierra Leone, Swaziland, Tanzania, Togo, Upper Volta, Zambia.

Asia: Afghanistan, Bangladesh, India, Indonesia, Korea, Nepal, Pakistan, Philippines, Sri Lanka, Taiwan, Thailand.

Europe: Hungary, Italy, Spain, Yugoslavia.

Mesoamerica: Bahamas, Belize, Costa Rica, Honduras, Jamaica, Martinique, Nicaragua, Panama, Trinidad & Tobago.

Middle East: Iran, Israel, Jordan, Lebanon, Saudi Arabia.

North America: United States.

Oceania: Fiji, Tahiti.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Guyana, Peru, Venezuela.

Note 1. This is the earliest document seen (Aug. 2008) concerning soybeans in Niger, or the cultivation of soybeans in Niger. On 3 July 1975 fifteen soybean varieties were planted at Maradi, Niger; two days later the same 15 varieties were planted at Gaya, Niger. The research was conducted under the auspices of the Director, Institut de Recherches Agronomiques Tropicales (IRAT), Station de Tarna, B.P. 6, Maradi, Niger. At Maradi, Forrest gave the highest yield, 3,501 kg/ha and nine varieties gave yields of over 3,000 kg/ha. At Gaya, Jupiter gave the highest yield, 1,925 kg/ha.

Note 2. This is the second earliest document seen (Jan. 2002) for the cultivation of soybeans in French Guiana (12 Dec. 1975). On 12 Dec. 1975, cooperators Mr. J. Larcher and Mr. P. Midras (Institut de Recherches Agronomiques Tropicales, Station de Cabassou, B.P. 60, 97301 Cayenne, French Guiana), planted fifteen varieties of soybeans at Cayenne. Jupiter gave the highest yield, 3,445 kg/ha.

Note 3. This is the 2nd earliest document seen (April 2005) concerning soybeans in French Polynesia (or Tahiti), or the cultivation of soybeans in French Polynesia. This document contains the 2nd earliest date seen for soybeans on French Polynesia, or the cultivation of soybeans on French Polynesia (3 Dec. 1975). Thirteen varieties were tested at Papeete (capital of French Polynesia on the island of Tahiti), under the direction of Mr. Jean-Louis Reboul and Mr. Robert Yau-Akui, *Service de l'Economie Rurale*, B.P. 100, Papeete, Tahiti, French Polynesia. Davis gave the highest yield, 4,902 kg/ha.

This is the earliest document seen (Jan. 2005) concerning soybeans in Niger, or the cultivation of soybeans in Niger. This document contains the earliest date seen for soybeans in Niger, or the cultivation of soybeans in Niger (3 July 1975). Fifteen varieties were tested at Maradi under the direction of IRAT, Station de Tarna, B.P. 6, Maradi, Niger. Forrest gave the highest yield, 3,501 kg/ha. On 5 July 1975, fifteen varieties were tested at Gaya; Jupiter gave the highest yield, 1,925 kg/ha.

This document also contains an early clear date seen for soybeans in Senegal, and the cultivation of soybeans in Senegal (9 July 1975; one of two documents). Fifteen varieties were tested at Sefa under the direction of Mr. Jean Durovray, C.N.R.A., Sefa, Senegal. Jupiter gave the highest yield, 2,025 kg/ha.

This is the earliest document seen (Jan. 2005) concerning soybeans in Martinique, or the cultivation of soybeans in Martinique. This document contains the earliest date seen for soybeans on Martinique, or the cultivation of soybeans on Martinique (10 April 1975). Fifteen varieties were tested at Fort de France, under the direction of Mr. Daly, IRAT, Le Lamentin, B.P. 427, Fort de France, Martinique. Improved Pelican gave the highest yield, 2,154 kg/ha.

This is the earliest reliable document seen (March 2006) concerning soybeans in Togo, or the cultivation of soybeans in Togo. This document contains the earliest solid date seen for soybeans in Togo or the cultivation of soybeans in Togo (2 May 1975). On May 2 fifteen varieties of soybeans were planted at Davié in southern Togo under the direction of Mr. J. Marquette, Le Chef de la Mission, IRAT au Togo, B.P. 1163, Lome, Togo. Davis gave the best yield, 3,563 kg/ha. On May 7 fifteen varieties were grown at Amoutchou; Jupiter gave the best yield, 3,667 kg/ha. On July 8 eleven varieties were grown at Kitangbao; Jupiter gave the best yield, 3,292 kg/ha. The source of the soybeans in each country was INTSOY for ISVEX trials. Address: College of Agriculture, Univ. of Illinois, Urbana-Champaign.

803. Judy, W.H.; Whigham, D.K. 1978. International soybean variety experiment: Fourth report of results, 1976. *INTSOY Series* No. 16. x + 401 p. Oct. (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** In the ISVEX trials, soybeans were tested in the following regions and countries: Africa: Algeria, Benin, Botswana, Burundi, Cameroon, Central African Empire, Congo, Egypt, Ethiopia, Gabon, Ghana, Ivory Coast, Lesotho, Mali, Niger, Nigeria, Rhodesia, Somalia, Sudan, Swaziland, Tanzania, Togo, Uganda, Upper Volta, Zaire, Zambia.

Asia: Bangladesh, India, Indonesia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand.

Europe: Hungary, Italy, Poland, Portugal, Spain, Yugoslavia.

Mesoamerica: Bahamas, Dominican Republic, Jamaica, Mexico, Nicaragua, Puerto Rico, Trinidad & Tobago.

Middle East: Iran, Iraq, Israel, Jordan, Saudi Arabia.

North America: United States.

Oceania: New Caledonia, New Hebrides, Tahiti, Hawaii.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay.

Note 1. This is the earliest document seen (Aug. 2009) concerning soybeans in Botswana, or the cultivation of soybeans in Botswana. This document contains the earliest date seen for soybeans in Botswana, or the cultivation of soybeans in Botswana (3 Nov. 1976). On 3 Nov. 1976, under the direction of Ms. Lynn A. Miller (Mahalapye Rural Training Center, Box 300, Mahalapye, Botswana), twelve varieties of soybeans were planted at Mahalapye. Ransom gave the best yield, 3,244 kg/ha. On 25 Nov. 1976 sixteen varieties were planted at Gaborone. Davis gave the best yield, 1,668 kg/ha.

Note 2. This is the second earliest document seen (April 2004) concerning soybeans in Gabon, or the cultivation of soybeans in Gabon–but the first that gives details. This document contains the earliest date seen for soybeans in Gabon, or the cultivation of soybeans in Gabon (30 Sept. 1976). Eight varieties of soybeans were grown at Ntoum, under the direction of Mr. J. van Amerongen and Mr. G. Van de Plas (Project CIAM, B.P. 5, Ntoum, Gabon). Jupiter gave the best yield, 1,159 kg/ha.

Note 3. This is the earliest document seen (March 2010) concerning soybeans in New Hebrides [later renamed Vanuatu], or the cultivation of soybeans in New Hebrides. This document contains the earliest date seen for soybeans in New Hebrides, or the cultivation of soybeans in New Hebrides (25 June 1976). Sixteen varieties of soybeans were grown at Port Vila, under the direction of Mr. B.L. Weightman (Dep. of Agriculture, Tagabe Agricultural Station, Port Vila, New Hebrides). Calland gave the best yield, 2,581 kg/ha. Port Vila, on the island of Efate (Éfaté), is the capital of Vanuatu.

Note 4. This document also contains the earliest date seen (Jan. 2001) for ISVEX soybean trials in the Central African Empire / Republic, or the cultivation of ISVEX soybeans in the Central African Empire / Republic (28 June 1976). Thirteen varieties of soybeans were grown at Bossangoa. Davis gave the best yield, 1,780 kg/ha.

The source of the soybeans in each country was INTSOY for ISVEX trials. Address: College of Agriculture, Univ. of Illinois, Urbana-Champaign.

804. Paschal, E.H., II; Ellis, M.A. 1978. Variation in seed quality characteristics of tropically grown soybeans. *Crop Science* 18(5):837-40. Sept/Oct. [13 ref]
• ***Summary:*** "Twenty-four soybean collections were grown in two different seasons in Puerto Rico to determine the extent of variation in the incidence of seed infection by fungi and its effect on seed viability under tropical conditions." Seed quality is a major obstacle to the expansion of soybean production in the tropics, where there is high temperature and humidity. Yet soybeans have been cultivated for ages in Southeast Asia (as in Indonesia) where conditions are unfavorable to the production of high quality seed, so varieties that perform well under these conditions might exist. INTSOY as initiated research to improve seed quality in soybean varieties adapted to tropical conditions. This study found that many of the varieties that yielded seed with superior quality were, indeed, from Southeast Asia.

Table 1 shows the origin or parentage of 24 soybean accesses. Twenty of these have PI (Plant Introduction) numbers and four have names: Arisoy, Hardee, Improved Pelican, and Jupiter. The origin of those with PI numbers is: Australia, Brazil, Colombia, Guatemala, Hawaii, India, Indonesia, Japan, Philippines, Surinam, Tanzania, and Thailand. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL, and Dep. of Crop Protection, Univ. of Puerto Rico, Mayaguez, PR 00708.

805. Shurtleff, William. 1978. Tofu shops and soy dairies in the West. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 2 p. Undated. Unpublished typescript.
• ***Summary:*** Lists the name, address, phone number and owner of all known tofu shops and soy dairies in the USA (alphabetically by state, and within each state alphabetically by city), Canada, Latin America, Europe, and Australia. There are 122 tofu shops and soy dairies in the USA and Canada, and 138 on the entire list.

This list appeared in the first Ballantine Books edition of *The Book of Tofu,* which was available on 22 Dec. 1978, although the date on the copyright page is Jan. 1979. We checked the last dummies on 23 Oct. 1978–which is the latest date we could have submitted this list. Address: Lafayette, California. Phone: 415-283-2991.

806. Chandra, S. 1978. Monoculture, mixed cropping and rotations: Implications for Fiji agriculture. *Fiji Agricultural Journal* 40(2):63-70. July/Dec. [29 ref]
• ***Summary:*** On 26 March 1974 at the Legalega Research Station in Fiji, three varieties each of soyabean, mung, urd, and cowpeas were sown as intercrops in sugar cane to measure their yield variability. Details of fertilizer use and plant spacing are given. Though intercropping reduced the yields of the legume crops significantly, the yield of sugar cane did not decrease, and in some tries it increased slightly. The total gross revenue generated by intercropping was better than if these crops were grown singly, and the legumes probably increased the soil fertility, especially the nitrogen level.

In the dry zones of Fiji, Bua and Macuata provinces in Vanua Levu, large scale production of sorghum, cowpeas, soyabean, and peanuts are being planned. Address: Research Div., Dep. of Agriculture, Fiji.

807. Bromfield, K.R. 1978. Comparison of four cultures of the soybean rust pathogen, *Phakopsora pachyrhizi,* from widely separated geographical areas (Abstract). *Phytopathology News* 12(9):140. *
• ***Summary:*** Soybean accessions from Australia, India, Puerto Rico, and Taiwan were inoculated with isolates of soybean rust.

808. Keogh, R.C. 1978. Studies on the survival, distribution, and host-parasite relationships of *Phakopsora pachyrhizi* Syd. PhD thesis, University of Sydney. viii + 227 p. *
Address: Australia.

809. **Product Name:** Sanitarium Health Foods Bologna (Canned Frankfurter Flavored Loaf).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1978.
Ingredients: Wheat protein, vegetable oil, yeast, soy protein, salt, Savex, hydrolysed vegetable protein, rice, garlic, onion.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. Photo shows a cylindrical Bologna loaf on a bed of rice and mushrooms. "Vegetable Protein–Ideal for salads, casseroles, sandwiches, etc." Recipes for Spanish Salad and Bologna Contadini.

Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1978.

810. **Product Name:** Sanitarium Health Foods Vita-Burger (Flavoured T.V.P.).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1978.
Ingredients: Soy flour, salt, hydrolysed vegetable protein, flavouring, syrup, caramel.
Wt/Vol., Packaging, Price: 200 gm box.
How Stored: Shelf stable.
Nutrition: Protein 50%, moisture 8%, ash 8%, fibre 3%, carbohydrate 30%, fat 1%.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. Box. 13 by 9.5 inches. Full color. Photo shows 7 burgers in tomato sauce in a skillet. "Textured Vegetable Protein. Main course vegetable protein. Ideal for patties, burgers, casseroles." Recipes for Spaghetti Sauce and Vita-Burgers (hamburgers).

Letter from Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1978.

811. **Product Name:** Sanitarium Health Foods Pelletized Flake Biscuits.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia.
Date of Introduction: 1978.
New Product–Documentation: *Soybean Digest Blue Book.* 1978. p. 26.

812. Association for Science Cooperation in Asia. 1978. Food technology for developing countries, 6th. Wellington, New Zealand: ASCA. 107 p. Held in Feb. 1978 at Palmerston North, New Zealand. *

813. Huriati, Isna. 1978. A study of the storage stability of dehydrated tempeh. MSc thesis, University of New South Wales, Sidney, Australia. 74 p. *
Address: Sidney, Australia.

814. Karan, B.; Viner, R.C.; Vesper, S.; Nath, R.; Chinappa, N.; Prasad, M.; Navuku, A. (Mrs). 1978. Pulses. *Fiji Dep. of Agriculture, Annual Research Report* For the year 1976. p. 23-36.
• ***Summary:*** The following pulse crops were tested: Peanuts, soyabeans, pigeon peas, mung, urd, cowpeas, other crops.

The subsection on soyabean states: "Variety Trial: The screening of soyabean varieties to evaluate various introductions for their suitability under Fiji conditions continued in 1976. Two Intsoy trials were laid out, one at Legalega and one at Sesake, Bua. Also one variety trial of previously introduced material was laid out at Legalega." In Intsoy trial 65 at Legalega, a table shows that 15 varieties were tested. Hardee gave the highest mean yield of 3,100 kg/ha. The maturity period in days, oil content (%), protein content (%), and Bacterial Pustule index are given. In the other trial at Sesake, 10 varieties were tested. K54 gave the highest mean yield of 2,100 kg/ha. Bacterial Pustule disease was a problem. Weeding was done by hand. Furadan application on sowing gave protection from insects on foliage, but sprays were necessary for the Green Vegetable Bug *(Nezera)* on the developing pods. "The trial sown in Sesake had very low yields owing to poor nutritional status of the soil and greater weed and insect competition."
Address: Fiji.

815. Marukome Miso K.K. 1978. Go annai [Introduction (Brochure)]. Nagano, Japan. 10 p. 30 cm. [Jap]
• ***Summary:*** Contents: Introduction. About the company: Aerial color photo, statistics (factory is 39,000 square meters, annual production of miso is 30,000 tons/year), chronology of company (started in 1854). The miso production process, with 10 color photos including one of an automated koji room. The company's products (9 color photos, incl. Maru-chan). Film strips / Clips from color TV commercials. Map showing location of regional plants and sales offices. Marukome soybean farm in New South Wales, Australia. Address: Nagano City, Japan. Phone: (0262) 26-0255.

816. Quick, Graeme R.; Buchele, Wesley F. 1978. The grain harvesters. St. Joseph, Michigan: American Society of Agricultural Engineers (ASAE). vii + 269 p. Illust. No index. 29 cm. [337 ref]

• ***Summary:*** Chapter 21, titled "Cinderella Soybeans" (p. 225-39) contains one of the best histories of the use of combines for harvesting soybeans. Address: 1. Melbourne, Victoria, Australia; 2. Iowa State Univ., Ames, Iowa.

817. Yanwar, Afrida Nazir; Saparsih, Sri Budhi. comps. 1978. Selected abstracts of traditional fermented food. Jakarta, Indonesia: National Scientific Documentation Center, Indonesian Institute of Sciences (PDIN–LIPI). iv + 470 p. Author index. 29 cm. [506 soy ref]

• ***Summary:*** These are abstracts of documents published from 1910 to 1976 on traditional fermented food, particularly of food prepared and consumed in Southeast Asia and the Far East. Each chapter is divided into 6 sections: Method of preparation, microorganisms, fermentation studies, nutritive values, other influence in the foodstuff, storage. Within each section, the references are listed alphabetically by author. The source of most of the references is *Chemical Abstracts*, to which an exact citation is usually given.

Contents: Preface. Introduction. 1. Fermented rice (incl. tape ketan [tapeh], sake, awamori). 2. Fermented soy beans: Soysauce (p. 173-294; 350 references), tempe (p. 294-307; 43 refs), natto (p. 307-312; 13 refs), miso (p. 312-343; 100 refs). 3. Fermented coconut press cake (bongkrek; p. 345-47). 4. Sauerkraut. 5. Fermented fish. 6. Vinegar. 7. Fermented cassava (tape / tapeh). Author index (p. 459-70).

Financial assistance was received from the National Institute of Chemistry, the Indonesian Institute of Sciences, the Indonesian Protein Project in the framework of ASEAN–Australian Economic Co-operation. Address: Indonesia.

818. Potter, J.D.; Topping, D.L.; Oakenfull, D. 1979. Soya, saponins, and plasma-cholesterol. *Lancet* i(8109):223. Jan. 27. [16 ref]

• ***Summary:*** Suggests that the hypocholesterolaemic action of soybean products is attributable to the presence of saponins, not to the amino acid content. Address: 1-2. CSIRO Div. of Human Nutrition, Adelaide, South Australia 5000, Australia; 3. CSIRO Div. of Food Research, North Ryde, New South Wales.

819. McLean, R.J. 1979. Histological studies of resistance to soybean rust, *Phakopsora pachyrhizi* Syd. *Australian J. of Agricultural Research* 30(1):77-84. Jan. [20 ref] Address: Dep. of Botany, Univ. of Queensland, St. Lucia, Qld 4067..

820. Pelaez, R.; Walker, D.M. 1979. Milk replacers for preruminant lambs: Limiting amino acids in two soybean protein isolates determined with a change-over design. *Australian J. of Agricultural Research* 30(1):125-34. Jan. [15 ref]

• ***Summary:*** Methionine was the first limiting amino acid; Lysine and threonine were second limiting. The mean digestibility coefficient of nitrogen in isolated soy protein B (ISP-B) was 0.842, and the diets containing it were readily accepted by lambs. Address: 1. Departamento de Alimentacion, Facultad de Veterinaria de Leon, Leon, Spain; 2. Dep. of Animal Husbandry, Univ. of Sydney, NSW 2006, Australia.

821. Shurtleff, William. 1979. Protein source for the future. *Cosmos (NSW, Australia)* 6(6):1, 4-5. Jan.

• ***Summary:*** Gives ten reasons why soybeans soy will be the protein source of the future: 1. Optimum land utilization. 2. Lowest cost protein. 3. High nutritional value. 4. Time tested. 5. Remarkably versatile. 6. Appropriate technology. 7. New dairylike products. 8. Hardy and adaptive. 9. Free nitrogen fertilizer. 10. Energy and resource efficient. "All of these ten factors work together synergistically, reinforcing one another, to give added weight to the prediction that soybeans will be a key protein source for the future on plant earth."

Note: This information was published in July 1979 in *The Book of Tempeh* (p. 21-24). Address: Lafayette, California.

822. Wang, H.L.; Mustakas, G.C.; Wolf, W.J.; Wang, L.C.; Hesseltine, C.W.; Bagley, E.B. 1979. Soybeans as human food: Unprocessed and simply processed. *USDA Utilization Research Report* No. 5. iv + 54 p. Jan. Slightly revised, July 1979. Jan. No index. 28 cm. Compiled for USAID. [50+ ref]

• ***Summary:*** Contents: Introduction. 1. Soybean food uses in Asia. China: Soaking dry soybeans, tou chiang (soybean milk), tou fu (soybean curd), processed tou fu products, tou fu pi (protein-lipid films), huang tou ya (soybean sprouts), whole soybeans, fermented soybean foods, production and consumption. Japan: Tofu (soybean curd), kinugoshi tofu, processed tofu products, yuba (protein-lipid film), soybean milk, gô (ground soybean mash), daizu no moyashi (soybean sprouts), whole soybeans, fermented soybean food, production and consumption. Korea: Tubu (soybean curd), processed tubu product, soybean sprouts, whole soybeans, soybean flour, fermented soybean food, production and consumption. Indonesia: Tahu or tahoo (soybean curd), bubuk kedele (soybean powder), tempe kedele, tempe gembus [the name in Central and East Java for okara tempeh], oncom tahu [the name in West Java for okara onchom], other soybean products (soybean sprouts, green soybeans, roasted and boiled soybeans, kecap (soy sauce}, tauco {soybean paste}), food mixtures, production and consumption. Thailand: Tofu *(tauhu)*, soy sauce, green soybeans in the pods *(tourae)*. Philippines: Soybean sprouts, soybean coffee, soybean cake, soybean milk, tou fu and processed tou fu products, production and consumption. Burma. India. Malaysia. Nepal. Singapore. Sri Lanka (Ceylon). Vietnam. Middle East. References–Soybean food uses in Asia.

2. Soybean food uses in Africa. Ethiopia: Injera, wots and allichas, kitta, dabbo, dabokolo, porridge. Kenya. Morocco. Nigeria: Whole soybeans, soybean paste, corn-soy mixtures (soy-ogi). Tanzania. Uganda. Production. References–Soybean food uses in Africa.

3. Soybean food uses in Europe and U.S.S.R.

4. Soybean food uses in Latin America. Argentina. Bolivia. Brazil. Chile. Colombia. Ecuador. Guyana. Paraguay. Peru. Uruguay. Venezuela. Mexico: New village process, commercial developments. Honduras. Costa Rica. Panama. Dominican Republic. Jamaica. Haiti. Trinidad. References–Soybean food uses in Latin America.

5. Soybean food uses in North America. United States. Canada. References–Soybean food uses in North America.

6. Soybean food uses in Australia. 7. Summary of soybean food uses. Traditional soybean foods: Soybean milk, soybean curd and processed soybean curd products, protein-lipid film, soybean sprouts, tempe (tempeh), green soybeans, boiled soybeans, roasted soybeans, soybean flour, soy sauce, fermented soybean paste, fermented whole soybeans, natto, fermented soybean curd. Experimental soybean foods: Whole soybean foods, soybean paste, soy flour, soy beverage. Production and consumption.

8. Simple village process for processing whole soybeans: Equipment, process, sanitation requirements, quality of product, evaluation of product in formulas and procedures for family and institutional use in developing countries. NRRC village process. 9. Industrial production and selling prices of edible soybean protein products.

10. Barriers to accepting and using soybeans in food: Availability. Cultural and social factors. Texture. Flavor. Nutrition and food safety. Technology development. Technology transfer. Address: NRRC, Peoria, Illinois.

823. Kochman, J.K. 1979. The effect of temperature on development of soybean rust *(Phakopsora pachyrhizi)*. *Australian J. of Agricultural Research* 30(2):273-77. March. [8 ref]

• ***Summary:*** Uredospore survival and development of soybean rust were examined across a range of temperatures. A temperature range of 17-27°C provides the best conditions for soybean rust development. At present, little is known about the epidemiology of the disease. Address: Plant Pathology Branch, Queensland Dep. of Primary Industries, P.O. Box 102, Toowoomba, Qld 4350, Australia.

824. Oakenfull, D.G.; Fenwick, Dorothy E.; Hood, R.L.; Topping, D.L.; Illman, R.L.; Storer, G.B. 1979. Effects of saponins on bile acids and plasma lipids in the rat. *British J. of Nutrition* 42(2):209-16. March. [37 ref]

• ***Summary:*** Saponins, which are prevalent in soybeans, partially reversed the high blood cholesterol levels caused by a high-cholesterol diet and increased the rate of bile acid secretion and of fecal excretion of bile acids and neutral sterols. These results are discussed in relation to the hypothesis that saponins act by inducing the adsorption of bile acids by dietary fiber. Address: 1-3. CSIRO Div. of Food Research, P.O. Box 52, North Ryde, NSW 2113 Australia; 4-6. CSIRO Div. of Human Nutrition, Kintore Ave., Adelaide, SA 5000.

825. **Product Name:** Tofu.
Manufacturer's Name: Soy Bean Factory (The).
Manufacturer's Address: 56 Sophia St., 1st Floor, Surrey Hills, NSW, Australia.
Date of Introduction: 1979. April.
New Product–Documentation: Shurtleff & Aoyagi. 1978. Dec. *The Book of Tofu* (Ballantine pocketbook edition). "Appendix B: Tofu Shops and Soy Dairies in the West." p. 400. Owners: Marcea Newman and Yoshiko Wright.

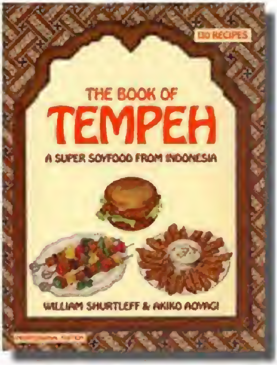
Fenwick & Oakenfull. 1981. (Manuscript received 19 May 1980). Tofu was received from The Soy Bean Factory, Surrey Hills, New South Wales. Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: Marcea Weber & Yoshiko Wright.

Martha Wagner. 1981. Soyfoods. Summer. p. 11. "Soy down under." "Marcea Weber owns The Soybean Factory located just outside of Sydney, Australia... Marcea, originally from New York, began her tofu business three years ago, about a year after arriving in Australia from England..."

Letter from Ken Alexander of Daylesford, Australia. 1982. Oct. 21. Marcea Weber is working on a small scale in Sydney for a relatively "innocent" market.

Letter from Marcea Newman Weber. 1995. Feb. 12. "The Soy Bean Factory was established in Dec. 1978, when Michael De Campo, Yoshiko Wright and Marcea Weber started a company devoted to producing traditional Japanese tofu using nigari (a sea water extract) as a coagulating agent. The fresh Japanese-style tofu began to arrive in the health food stores and Japanese supermarkets around April 1979." See this letter for a history of the company. Marcea thinks (but is not sure) that the name was originally spelled "Soy Bean Factory." She would guess that they first started to make and sell tofu in about March or April of 1979. Tofu was the only product they ever made commercially. The owners were Marcea Weber, Michael De Campo, and Yoshiko Wright.

826. Shurtleff, William; Aoyagi, Akiko. 1979. The book of tempeh: A super soyfood from Indonesia. Professional hardcover edition. New York, NY: Harper & Row. 248 p. Illust. by Akiko Aoyagi Shurtleff. Index. July. 28 cm. [190 ref]


130 RECIPES
THE BOOK OF
TEMPEH
A SUPER SOYFOOD FROM INDONESIA
WILLIAM SHURTLEFF & AKIKO AOYAGI

• ***Summary:*** A special cloth-bound professional edition of *The Book of Tempeh* prepared for libraries, commercial tempeh producers, microbiologists, students of Indonesian foods, and those who love fine books. In addition to the full contents of the paperback edition, it contains the following lengthy appendixes: The Microbiology & Chemistry of Tempeh Fermentation. Tempeh in Indonesia (an overview of the tempeh industry and market, including the number of shops by province, per capita consumption, etc.). The Varieties of Tempeh. Soybean Production and Traditional Soyfoods in Indonesia. Onchom or Ontjom. A Glossary of Indonesian Foods (the most extensive one available in English). Bibliography on Tempeh containing over 190 entries. Expanded Index. A great deal of original research is contained in the extra 88 pages and 54 illustrations.

Appendix C, "The varieties of tempeh, states: "The many varieties of tempeh may be grouped into five basic types, according to the primary ingredient used: legumes, grains & soy, grains, presscake residues, and nonlegume seeds. Legume tempehs: Soy tempeh *(témpé kedelé or kedelai,* made from the seeds of *Glycine max).* Velvet-bean tempeh *(tempe benguk or tempe koro benguk,* made from the seeds of *Mucuna pruriens,* which are called *kara benguk* in Indonesian). Winged-bean tempeh *(tempe kecipir,* made from the seeds of *Psophocarpus tetragonolobus).* Leucaena tempeh *(tempe lamtoro or tempe mlandingan,* made from the seeds of *Leucena leucocephala).* Mung bean tempeh *(tempe kacang hijau,* made from the seeds of *Vigna radiata,* which are called *kachang hijau* in Indonesian). Broad-bean or fava-bean tempeh *(tempe kacang babi,* made from the seeds of *Vicia faba,* also called horse beans). Sesban-bean tempeh *(tempe turi,* made from the seeds of *Sesbania grandiflora).* Pigeon-pea tempeh *(tempe kacang iris,* made from the seeds of *Cajanus cajan).* Green-bean tempeh *(tempe kacang merah,* made from the seeds of *Phaseolus vulgaris,* which are called *kacang buncis* in Indonesian). Lima-bean tempeh *(tempe kara or tempe kara kratok,* made from the seeds of *Phaseolus lunatus).* Lablab-bean tempeh *(tempe kara-kara or tempe koro wedus,* made from the seeds of *Lablab purpureus,* which is called hyacinth bean in the USA). Jack-bean tempeh *(tempe kara bedong or tempe kara pedang,* made from the seeds of some strains of *Canavalia ensiformis).* Lupin tempeh (developed in Australia, made from the seeds of the narrow-leafed sweet lupin *(Lupinus angustifolius)* or the Andean lupin *(Lupinus mutabilis)).* Cowpea or black-eyed pea tempeh (developed in West Africa and Thailand, made from the seeds of *Vigna unguiculata).* Note: Chickpeas (garbanzo beans), baby limas, and great northern beans have also been used to make tempeh.

Grain & soy tempehs: Wheat & soy tempeh, barley & soy tempeh, rice & soy tempeh, bulgur & soy tempeh. Grain tempehs: Barley, rice, wheat, oats, and rye have been used with good results.

Presscake tempehs: Okara tempeh (called *tempe gembus* in Central and East Java where it is most popular, and called *oncom hitam* in West Java where it is not widely used). Peanut presscake tempeh (called black onchom *(oncom hitam)* in the Bogor region of West Java where it is most widely consumed, or white onchom *(oncom putih)* in the Tasikmalaya region, or "tempeh from peanut presscake" *(tempe bungkil kacang)* in East Java). Coconut presscake tempeh *(tempe bongkrek, tempe bungkil kelapa, or tempe kapuk)* comes in several varieties and can be can be poisonous if the pathogenic aerobic bacterium *Pseudomonas cocovenenans* grows on it and produces either yellow-colored toxoflavin or the more toxic colorless bongkrek acid. Peanut- & coconut-presscake tempeh *(tempe menjes).* Mung-bean-presscake tempeh *(oncom hitam or oncom ampas kacang hijau).* Soy- & peanut-presscake tempeh. Defatted soy-meal tempeh.

Seed tempehs (nonleguminous): Rubberseed tempeh *(tempe kaloko)* is made from the seeds of the rubber tree *(Hevea brasiliemsis).* Okra tempeh. Sesame & soy tempeh. Tempeh extenders and adulterants: Okara, cassava, mung-bean presscake, soybean hulls, sweet potato, coconut- or peanut presscake, papaya. The stages of tempeh fermentation (underripe to overripe): Premature tempeh *(tempe koro),* mature tempeh, slightly overripe tempeh *(tempe semangit or tempe lanas)*, overripe tempeh *(tempe busuk or tempe bosok)*, rotten tempeh. Tempeh wrappers.

Appendix D: "Soybean production and traditional soyfoods in Indonesia" discusses: Soybean production in Indonesia. traditional Indonesian soyfoods: Kechap *(kecap / ketjap)*, taucho *(tauco or taoco)*, okara onchom, sereh *(sere)*, taokoan or takoa, tofu *(tahu)*. Other nonfermented soyfoods: Soy sprouts *(taugé kedele)*, yuba *(bungah tahu)*, soymilk, roasted soybeans *(dele sangan, kedele sangrai)*, roasted soy grits or full-fat flour *(bubuk kedele)*, fresh green soybeans *(kedelai rebus)*.

Note: This is the earliest English-language document seen (March. 2009) uses the word "taucho" (spelled in that way) to refer to Indonesian-style miso.

Appendix E: "The microbiology and chemistry of tempeh fermentation" discusses: What are fungi?, general characteristics of *Rhizopus* molds, *Rhizopus* species used to make tempeh, pure cultures versus mixed cultures, preparing soybeans for fermentation, requirements for mold growth, general changes during tempeh fermentation, changes in nutrients and digestibility, the finished tempeh, the advantages and disadvantages of tempeh fermentation, suggestions for further research.

Appendix H: "Onchom or ontjom" discusses: Introduction. The varieties of onchom *(onchom merah* or *onchom beureum)*: Peanut-presscake onchom, okara onchom, soy onchom, coconut-presscake onchom. Making peanut-presscake onchom in a commercial shop. Making okara onchom in a commercial shop. The microbiology of onchom. Laboratory studies of onchom. Aflatoxins. Works on onchom and neurospora. People connected with onchom and neurospora. Address: New-Age Foods Study Center, P.O. Box 234, Lafayette, California 94549.

827. *Soybean Digest*.1979. Can breeders tame wild soybean varieties. July/Aug. p. SID-6.

• ***Summary:*** Discusses the work of Ted Hymowitz at the Univ. of Illinois. His research with wild species began in 1971. "Wild, perennial soybean relatives native to Australia and the South Pacific islands, may be of use to plant breeders in increasing soybean yields and disease resistance... 'Some of these species are found in the Australian desert and are obviously drought-tolerant. Others found along coastal areas may be salt-tolerant and some are resistant to certain viruses,' Hymowitz notes."

828. **Product Name:** Soysage Rolls (Meatless Sausage Rolls).
Manufacturer's Name: Cheryl Grimshaw Soyfoods.
Manufacturer's Address: Yandina, QLD, Australia.
Date of Introduction: 1979. September.
New Product–Documentation: Cain. 1981. Soyfoods. Summer. p. 43. "From Australia: Soysage Rolls Join the Take-Out menu."

829. Ogle, H.J.; Byth, D.E.; McLean, R. 1979. Effect of rust *(Phakospora pachyrhizi)* on soybean yield and quality in south-eastern Queensland. *Australian J. of Agricultural Research* 30(5):883-94. Sept. [25 ref]
Address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld. 4067 [Australia].

830. *North Pacific Union Conference Gleaner (Portland, Oregon)*.1979. Obituaries: Jones, Dorothea Van Gundy. Oct. 1. p. 31.

• ***Summary:*** "Dorothea Van Gundy Jones was born Feb. 16, 1903 in San Jose, California, and died Aug. 30, 1979 in Sedro Woolley, Washington. She leaves to mourn two daughters Lois Bower of Redding, California, and Evelyn Mundall of Belize, Central America; one sister, Dr. Mary Charlotte Holmes of Sulphur Springs, Arkansas; a niece, Sue Muff, Sedro Woolley; a cousin, Dr. Lloyd Waller of Chehalis, Washington. After graduating from Pacific Union College, she worked as a dietitian for the White Memorial Hospital, dietitian for La Sierra College for two years and taught three years at Walla Walla College. For 23 years, she was internationally known nutritionist for Loma Linda Foods. Her lectures on nutrition took her around the world; to India, Bangkok [Thailand], Indonesia, the Philippines, Japan, Australia, New Zealand as well as to most major cities in the U.S."

831. Judy, W.H.; Hill, H.J. 1979. International soybean variety experiment. Fifth report of results, 1977. *INTSOY Series* No. 19. x + 285 p. Dec. (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** In the ISVEX trials, soybeans were tested in the following regions and countries: Africa: Algeria, Cameroon, Egypt, Ethiopia, Ghana, Liberia, Mauritius, Morocco, Niger, Rhodesia (Salisbury; in today's Zimbabwe), Rwanda, Senegal, Somalia, Sudan, Swaziland, Tanzania, Togo, Upper Volta, Zaire, Zambia.

Asia: Bangladesh, Indonesia, Malaysia, Nepal, Pakistan, Philippines, Sri Lanka, Thailand.

Europe: Czechoslovakia, Italy, Portugal.

Mesoamerica: Honduras.

Middle East: Israel, Saudi Arabia.

North America: United States.

Oceania: Fiji, Tahiti.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Paraguay, Peru, Surinam, Uruguay.

Note: This is the second earliest document seen (Feb. 2006) concerning soybeans in Liberia, or the cultivation of soybeans in Liberia. This document contains the second earliest date seen for soybeans in Liberia, or the cultivation of soybeans in Liberia (21 Sept. 1977). Sixteen varieties were tested at Monrovia. Improved Pelican gave the highest yield, 1,603 kg/ha. On 14 Dec. 1977, sixteen varieties were tested at Suakoko. Calland gave the highest yield, 1,841 kg/ha. The source of these soybeans was INTSOY for ISVEX trials. Address: Univ. of Illinois, Urbana.

832. Melching, J. Stanley; Bromfield, K.R.; Kingsolver, C.H. 1979. Infection, colonization, and uredospore production on Wayne soybean by four cultures of *Phakopsora pachyrhizi*, the cause of soybean rust. *Phytopathology* 69(12):1262-65. Dec. [12 ref]

• ***Summary:*** Under greenhouse conditions, cultures of *Phakopsora pachyrhizi* from Taiwan, India, Australia, and Indonesia were compared for quantitative characteristics. Address: Research plant pathologists, Plant Disease Research Lab., USDA, SEA, Agricultural Research, P.O. Box 1209, Frederick, Maryland 21701.

833. Putievsky, E.; Broué, P. 1979. Cytogenetics of hybrids among perennial species of *Glycine* subgenus *Glycine*. *Australian J. of Botany* 27(6):713-23. Dec. [16 ref]

• ***Summary:*** A cytogenetic analysis based on F-1 hybrids shows that *G. clandestina* and *G. canescens* are closely related, and that either of these diploid species could have provided one genome for the tetraploid form of *G. tomentella*. It appears that *G. falcata* and *G. tabacina* are distinctive species that are not closely related to the three species mentioned above.

The authors reported the meiosis of the interspecies crosses *G. canescens* (2n = 40) x *G. clandestina* (2n = 40); *G. tomentella* (2n = 80) x *G. tabacina* (2n = 80); *G. tomentella* (2n = 80) x *G. canescens; G. falcata* (2n = 40) x *G. clandestina*. Two further combinations, *G. latrobeana* (2n = 40) x *G. tabacina* (2n = 40) and *G. falcata* x *G. canescens*, failed to establish so that cytological analysis was precluded. Address: 1. Div. of Medicinal and Spice Crops, Agricultural Research Organization, Newe Ya'ar Experiment Station, Israel; 2. Div. of Plant Industry, CSIRO, P.O. Box 1600, Canberra City, ACT 2601, Australia.

834. Keogh, R.C. 1979. Notes on the survival of *Phakopsora pachyrhizi* on natural stands of *Kennedia rubicana* in coastal New South Wales. *APP, Australasian Plant Pathology* 8(3):31-32. *

• ***Summary:*** This study showed that *Phakopsora pachyrhizi* could persist throughout the year on natural stands of *Kennedia rubicana*, an Australian native legume species. It repeatedly produced uredospores. Address: Australia.

835. **Product Name:** Bonsoy (Soymilk).
Manufacturer's Name: Spiral Foods (Importer). Made in Japan by Marusan. Imported via Muso Shokuhin.
Manufacturer's Address: Melbourne, Australia.
Date of Introduction: 1979.
Ingredients: Water, soybeans, pearl barley, kombu (sea vegetable), barley malt.
New Product–Documentation: Australian Dairy Foods. 1986. Feb. p. 84. A photo shows Barley Malt Bonsoy in a Tetra Brik carton. It is imported from Japan. Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update. Australian Dairy Foods. 1986. Feb. p. 84.

Sojarei (Austria) price list. 1989. Jan. The company markets this product in plain and cocoa flavors, in 500 ml and 1 liter sizes.

Talk with Ron Roller of Eden Foods. 1992. Feb. 26. When he visited the Muso office in Osaka, Japan, in Sept. 1982, he noticed very large shipments of soymilk in aseptic foil retort pouches, made by Marusan, being shipped to Spiral Foods (run by James Wilson) a macrobiotic distributor in Melbourne, Australia.

Talk with Yuko Okada. 1992. July 16. Muso first exported soymilk (Bonsoy) from Japan in about 1979 to Spiral Foods in Australia, owned by Jim Wilson. This soymilk was packaged in a foil retort pouch.

836. Stillman, S.L. 1979. Small plot evaluation of pasture grasses, legumes and forages in coastal southeast Queensland, Australia. *Queensland J. of Agricultural and Animal Sciences* 36(1):49-64. *

• ***Summary:*** Discusses *Glycine wightii*.

837. *Fiji Ministry of Agriculture & Fisheries, Annual Report*. 1979. Dry zone. For the year 1977. p. 30. Parliament of Fiji. Parliamentary Paper No. 1 of 1979.

• ***Summary:*** In Part II, Work of the Ministry, in the section titled "Research Division," is a subsection titled "Dry Zone" (p. 30) which discusses pulses and sorghum. Under pulses is the following paragraph: "Screening of 24 varieties of soyabean was carried out at Sesake in Bua and the best yield was 1,683 kg/ha." Address: Fiji.

838. Karan, B.; Viner, R.C.; Nath, R.; Prasad, M.; Prasad, R. 1979. Pulses. *Fiji Dep. of Agriculture, Annual Research Report* For the year 1978. p. 25-28.

• ***Summary:*** The following pulse crops were tested: Soyabeans, peanuts, pigeon peas, mung bean, urd.

The subsection on soyabeans (p. 25) states: "An Intsoy variety trial was sown in Lekutu, Bua in December 1977." Fertilizer and rhizobium were applied with the seed. Of the 16 varieties tested, the following gave the highest yields: Davis 2,220 kg/ha. B-1 1,970 kg/ha. Cobb 1,710 kg/ha. Bossier 1,610 kg/ha. The oil content (%) and protein content (%) are given for each variety. Davis contained 22.2% oil and 46.0% protein. "The four highest yielding varieties were all less than 40 cm high at harvest which makes them unsuited for mechanical harvesting. Improved Pelican has very good plant characteristics for harvesting, but is susceptible to Bacterial Pustule disease. Forty six new

lines from Australia were bulked up at the same location."
Address: Fiji.

839. Lawn, R.J.; Byth, D.E. 1979. Soybean. In: Alec Lazenby and J.V. Lovett, eds. 1979. Australian Field Crops. Vol. II. Sydney: Angus and Robertson. 328 p. See p. 198-231. [152 ref]

• ***Summary:*** Contents: Introduction. Uses. Taxonomy, origin and distribution. Morphology. Crop growth and development: Seedling establishment, vegetative growth and development, reproductive growth and development, root growth, nodulation and nitrogen fixation. Eco-physiological basis of adaptation: Photoperiod, temperature, soils, water requirements. Soybean improvement in Australia: Plant introduction, cultivars in Australia, soybean breeding, priorities for breeding in Australia. Agronomic principles and practice: Planting date, plant population and row width, planting, weed control, pests and diseases. Research needs.

"The potential of the soybean in Australia has been recognized for several decades. A Commonwealth mission to the U.S.A. in 1946 recommended governmental action to assist oilseed crop development in Australia, with particular reference to soybeans. A number of short-term soybean investigations were initiated, particularly in southern Australia, and were largely unsuccessful. Gray (1955) recommended that introduction activity should center on regions of lower latitude than those of the existing major soybean areas of the world. The first formal breeding program was started in 1958 by C.S.I.R.O. in southeastern Queensland, although useful selection was practised previously by the Queensland Department of Primary Industries. Only limited soybean areas existed (500-2000 ha), until the late 1960s, mainly in the South Burnett region. Major expansion began in 1970-71 and has continued so that Australian production is approaching local demand and exports from Australia are conceivable in the near future. Most of the current commercial production occurs in Queensland, in the eastern Darling Downs and St. George, the Fassifern, Lockyer and Brisbane Valleys, and the South Burnett region. The major area of production in New South Wales is centered in the Gwydir and Namoi Valleys on the north-western plain, with smaller areas in the coastal Northern Rivers District, and in the Lachlan and Macquarie Valleys of the central west. Irrigated farms account for most of the area, particularly in New South Wales. Concentration on irrigated production in the major grain-producing areas of both States appears likely to continue, although expansion of dryland production is occurring in the coastal and sub-coastal areas, and in northern Queensland.

Table 9.1 shows (1) Australian imports of soybean cake and meal, non-defatted meal, whole soybeans, oil, epoxydized oil, other oil, and total imports yearly from 1967 to 1974; (2) total hectarage and production in Queensland, New South Wales, and total Australia for the same time period. About 70-80% of the country's soybeans are produced in Queensland, and the rest in New South Wales.

Most of the current soybean production in Australia is carried out under contract to the major processors, and is used primarily for oil and meal production.

Soybean improvement in Australia has paralleled the pattern which occurred earlier in the U.S.: Introduction, selection among and within accessions, and hybridization. The majority of cultivars in Australia are direct introduction, unlike the U.S., where locally improved cultivars are used exclusively. The availability of improved cultivars from the southern areas of the U.S. was a major factor in the substantial expansion of soybean culture commencing in 1970-71. Regional experimentation has shown that a number of these cultivars are capable of high yields in sub-tropical Australia. Plant introduction has been active in Australia and over 1000 accessions have been obtained since the 1930s.

The primary objective of soybean breeding in the U.S. has been and continues to be the development for each region of pure-line cultivars capable of producing high harvestable yields of seed with suitable quality characteristics (oil and protein percentage and composition). A great deal of attention has been given to lodging, shatter resistance and seed pigmentation because of their agronomic or marketing importance. There is increasing emphasis on disease and pest resistance.

Expansion of soybean production in the immediate future will most likely occur primarily in irrigated areas. Present production areas are largely between 16ºS and 33ºS, and most of the anticipated expansion in the near future is expected to occur in this region. Address: CSIRO Div. of Tropical Crops and Pastures, Brisbane; Dep. of Agriculture, Univ. of Queensland.

840. McLean, R.J.; Byth, D.E. 1979. Histological studies of the penetration development and penetration of soybeans by rust, *Phakopsora pachyrhizi*, Syd. *Australian J. of Agricultural Research* 32(3):435-43. [22 ref]
Address: Dep. of Agriculture and Botany, Univ. of Queensland, St. Lucia, Qld 4067.

841. ASEAN Sub-Committee on Protein. 1980. ASEAN Protein Project. Bangkok, Thailand. 24 p. Jan. Illust. 29 cm. [Eng]

• ***Summary:*** Contents: Introduction (incl. history, programs, and budget). Administration (incl. list of workshops held by the ASEAN Sub-Committee on Protein). Research and development. High-protein low-cost foods. Full-fat soy flour (a plant at Chiang Rai, northern Thailand, produces 100 tons/month). Fermented foods (incl. soy sauce). Soy products (incl. tofu). ASEAN network (directory).

"The ASEAN Protein Project was conceived at a joint research project on soybeans and protein-rich foods at the first meeting of the ASEAN Permanent Committee on Science and Technology held in August 1971 in Indonesia. Meetings of food specialists soon followed, one in September 1972 in Malaysia and another in November 1972 in Indonesia. At a further meeting in August 1974, involving Australian technical experts, four areas for research co-operation were identified, namely: (1) Identification, development, and utilisation of low-cost, protein-rich foods for children and other vulnerable groups. (2) Processing and utilisation of full fat soy flour (3) Improvement of fermentation technology; and (4) Microbiological culture collection.

Workshops held by the ASEAN Sub-Committee that concern soya include: 1st Workshop on soy products (1976, Kuala Lumpur, Malaysia). 3rd Workshop on culture collection (1977, Bangkok, Thailand). 4th Workshop on soy sauce manufacturing techniques (1978, Singapore). 5th Workshop on solid substrate fermentation (1978, Bandung, Indonesia). 8th Workshop on extruder technology (1980, Bangkok, Thailand).

Photos show: (1-4) Participants, meetings, and tours. (5-6) Full fat soy plant at Chiang Rai, Thailand. (7) Commercial soy sauce factory. Address: Bangkok, Thailand.

842. Bhumiratana, Amara. ed. 1980. Proceedings: ASEAN workshop on extruder technology. Bangkok, Thailand: Kasetsart University. xiv + 249 p. Held 14-23 Jan. 1980 at Inst. of Food Research and Product Development, Kasetsart Univ., Bangkok, Thailand. Illust. No index. 30 cm.
• ***Summary:*** This is the eighth ASEAN Workshop. It is sponsored by the ASEAN-Australian Economic Program (through the ASEAN Sub-Committee on Protein). Contents: Acknowledgment (incl. sponsoring organization, and co-sponsoring and supporting organizations). Foreword, by Prof. Bhumiratana. Welcome address, by Prof. Dr. Phaitoon Ingkasuwan, Acting Rector, Kasetsart Univ. Keynote address, by Prof. Sanga Sabhasri, Secretary General, National Research Council at the 11th Meeting of ASEAN Sub-Committee on Protein... Opening address, by Mr. Orachun Tanaphong, Acting Director-General, ASEAN-Thailand... Technical sessions: Nine papers. Country reports: From Indonesia, Malaysia, Philippines, Singapore, and Thailand. Recommendations. List of participants (directory). Appendix–List of publications (84 references) available from American Soybean Assoc., 15012 Liat Tower, Orchard Road, Singapore. Address: Prof., Director, Inst. of Food Research and Product Development, Kasetsart Univ., Bangkok, Thailand.

843. Bromfield, K.R.; Melching, J.S.; Kingsolver, C.H. 1980. Virulence and aggressiveness of *Phakopsora pachyrhizi* isolates causing soybean rust. *Phytopathology* 70(1):17-21. Jan. [10 ref]
• ***Summary:*** Isolates of the soybean rust pathogen from Australia, India, Puerto Rico, and Taiwan were found to differ in virulence on a variety of soybean genotypes, including the variety Wayne. Address: Research plant pathologists, Plant Disease Research Lab., AR-SEA, USDA, P.O. Box 1209, Frederick, Maryland 21701.

844. Quick, Graeme R. 1980. An in-depth look at farm fuel alternatives. *Power Farming Magazine (Australia)* 89(2):10-17. Feb.
• ***Summary:*** Farmers in Australia are very dependent on liquid diesel fuel. Changes in fuel prices strongly affect farm profits. Clearly the trend towards minimum tillage, stubble retention, and direct drilling techniques has been hastened by rising fuel costs. And rising fuel costs make alternative energy sources more attractive. In the U.S. Midwest, gasohol is a motor blend of 10% agricultural ethanol (primarily from corn) and 90% lead-free gasoline. In Jan. 1978 there were just 3 outlets for gasohol, all in Illinois. Today over 1,000 stations are selling gasohol in 28 states.

The section titled "Plant oils" notes that "Dynometer [dynamometer] tests on diesels have been performed on peanut oil, sunflower, coconut, corn and soybean oils by Ward and Galloway of Townsville, Qld., on sunflower oil by Stecher at Footscray, Vic., and on rapeseed oil by Department of Agriculture officers in West Australia." Soybean oil was also studies by Iowa State University in the U.S. Generally good results were obtained (Figs. 14-16).

"Ultimately, we must learn to live on our income rather than consume our capital. In energy terms this means conservation and the swing to renewable alternatives to fossil fuels." Contains 17 charts and graphs.

Note: Neither methyl esters nor transesterification are mentioned. Address: PhD, Principal Research Scientist, CSIRO Div. of Mechanical Engineering, Highett, Victoria, Australia.

845. Dunn, Carole. 1980. Soya beans are good for human 'beans.' *Chronicle, Tuesday Magazine (Eumundi, Australia).* April 15. p. 11.
• ***Summary:*** Cyril and Elly Cain, originally from the USA but now living in Imbil, are selling soyfoods at the Saturday morning Eumundi market, including soymilk drinks, smoothies, plain tofu, flavored tofu dips and spreads, tofu sandwiches and burgers, Soysage rolls, ice bean (soy ice cream), and a variety of cakes and pies such as tofu cheesecake. A photo shows Elly smiling as she makes a sale at a tofu & soymilk stall; Cyril appears in the background.

846. Topping, David L.; Storer, G.B.; Calvert, G.D.; Illman, R.J.; Oakenfull, D.G.; Weller, R.A. 1980. Effects of dietary

saponins on fecal bile acids and neutral sterols, plasma lipids and lipoprotein turnover in the pig. *American J. of Clinical Nutrition* 33(4):783-86. April. [30 ref]
• ***Summary:*** In four young mature male pigs, soya saponins were found to enhance secretion of bile acids and neutrol sterols. The possible role of saponin-containing foods in the control of plasma cholesterol in humans is discussed. Address: CSIRO Div. of Human Nutrition, Kintore Ave., Adelaide, SA 5000, Australia, and Dep. of Clinical Biochemistry, Flinders Medical Centre, Adelaide, SA, 5042, and Div. of Food Research, CSIRO, Sydney, NSW 2113.

847. McLean, R.J.; Byth, D.E. 1980. Inheritance of resistance to soybean rust *(Phakopsora pachyrhizi)* in soybeans. *Australian J. of Agricultural Research* 31(5):951-56. Sept. [12 ref]
• ***Summary:*** Inheritance of resistance to soybean rust in three soybean accessions (PI 200492, Tainung 3 and Tainung 4) was studied. The results suggest that PI 200492 and Tainung 3 contain the same dominant gene for resistance, and that Tainung 4 contains two dominant genes for resistance, one of which is identical to that in PI 200492 and Tainung 3 (from AVRDC 1992, #208). Address: Dep. of Agriculture, Univ. of Queensland, St. Lucia, Qld 4067 [Australia].

848. Shurtleff, William. 1980. Tofu shops and soy dairies in the West. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 2 p. Sept. Unpublished typescript.
• ***Summary:*** Lists the name, address, phone number and owner of all known tofu shops and soy dairies in the USA (alphabetically by state), Canada, Latin America, Europe, Australia & New Zealand, Africa, and the Middle East. Address: Lafayette, California. Phone: 415-283-2991.

849. **Product Name:** Tofu.
Manufacturer's Name: Harvest Wholefoods.
Manufacturer's Address: 403 Richmond Rd., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1980. October.
Ingredients: Soybeans, water, nigari.
Wt/Vol., Packaging, Price: Packaged in bulk, under water.
How Stored: Refrigerated.
New Product–Documentation: Martha Wagner. 1981. Soyfoods. Summer, p. 11. "Soy down under." Harvest Whole Foods began producing tofu in a backroom kitchen last October [1980]. The three owners, Greg and Ricky Chalmers and Ricky's wife, Elizabeth, are producing about 170 to 299 kilos (374 to 440 pounds) of tofu a week.

Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Owners: Greg, Ricky, and Elizabeth Chalmers.

Chalmers, Elizabeth. 2007. Jan. 16. "Business history of the Chalmers family: Making soyfoods in New Zealand" (Interview). This tofu was packaged in bulk, refrigerated under water. We didn't start using organic soybeans until we started the Organic Soy Company in 1996.

Note: This is the earliest known commercial soy product made in New Zealand.

850. Potter, J.D.; Illman, R.J.; Calvert, G.D.; Oakenfull, D.G.; Topping, D.L. 1980. Soya saponins, plasma lipids, lipoproteins and fecal bile acids: A double blind cross-over study. *Nutrition Reports International* 22(4):521-28. Oct. [31 ref]
• ***Summary:*** It is known that soy products lower serum cholesterol levels but the mechanism by which they do this is not certain. To determine whether it reflected the presence of dietary saponins and whether dietary modification was of potential benefit, this cross-over study was conducted in young adult males with normal cholesterol levels. Saponins increased bile acid secretion but failed to modify plasma cholesterol levels. Address: 1. CSIRO Div. of Human Nutrition, Kintore Ave., Adelaide, South Australia, 5000.

851. Shurtleff, William; Aoyagi, Akiko. 1980. Making money making tofu. *Cosmos (NSW, Australia)*. Oct. p. 10-11.
• ***Summary:*** This is a reprint of an article originally published in the USA in *East West Journal* (Jan. 1980, p. 18-24). Address: Lafayette, California.

852. Topping, David L.; Trimble, R.P.; Illman, R.J.; Potter, J.D.; Oakenfull, D.G. 1980. Prevention of dietary hypercholesterolemia in the rat by soy flour high and low in saponins. *Nutrition Reports International* 22(4):513-19. Oct. [15 ref]
• ***Summary:*** In adult male rats, soya saponins were found to enhance secretion of bile acids. Address: 1-4. CSIRO, Div. of Human Nutrition, Glenthorne Physiology Lab., O'Halloran Hill, South Australia 5158, Australia.

853. **Product Name:** Tofu.
Manufacturer's Name: John Francis Tofu.
Manufacturer's Address: Brunswick Rd. 1, Wanganui, New Zealand.
Date of Introduction: 1980. November.
New Product–Documentation: Soyfoods Center. 1980. Nov. Tofu shops and soy dairies in the West (2 pages, typeset). Gives the company's name, address, and phone number. Owner: John Francis. The name of this very small town is pronounced wan-ga-NEW-ee.

854. Quick, Graeme R. 1980. Developments in use of vegetable oils as fuel for diesel engines. *American Society of Agricultural Engineers (ASAE), Paper* No. 80-1525. 15 p. Presented at the 1980 winter meeting, 2-5 Dec. 1980, Chicago, Illinois, Palmer House Hotel. [37 ref]

• ***Summary:*** An early work on biodiesel. Contents: 1. Introduction. 2. Why the interest in oilseed fruits. 3. Short-term engine performance on oilseed fuels. 4. Longer-term engine performance. 5. Viscosity modification. 6. Refinery processing and other oil modifications for fuel. 7. Blends and additives. 8. Conclusions. Acknowledgements.

Under "Viscosity modification we read: "Another way to reduce viscosity of a vegetable oil is to change its chemical composition to that of the oil's methyl or ethyl esters. This further processing, while comparatively simple, adds measurably to the cost of oilseed fuels (Meggitt Ltd., personal communication, 1980). Esterification has the combined effect of bringing the distillation curve of the fuel nearer to that of diesel (Bruwer et al., 1980) and of reducing viscosity near to that of diesel, Fig. 5.

Tables: (1) Summary of selected short-term engine test results postwar on straight oilseed fuels (1947-1980). (2) Typical fuel properties (diesel fuel vs. sunflower oil; ASTM–Gross heat value, specific gravity, viscosity, cetane number, flash point, cloud point, carbon residue, ash weight, distillation 90% point, sulphur, copper strip corrosion).

Figures: (1) Performance envelopes of an International Harvester 284 D three cylinder indirect injection naturally aspirated diesel tractor engine (Power, torque, fuel consumption, and efficiency, plotted against engine speed in rpm). (2) Energy density spectrum for a range of liquid fuels (gross calorific values on volumetric basis; incl. "diesel, ethanol, methanol, LPG, vegoil"). (3) Power output at maximum torque (Kubota L245DT 3 cylinder diesel tractor; 5 fuel oils; distillate, safflower, sunflower, rapeseed, linseed). (4) Smoke density at maximum torque loading (same 5 fuel oils). (5) Kinematic viscosity ranking of a range of oilseed fuel candidates at 37.8 deg. C (ascending: ethanol, diesel distillate, safflower methyl ester, 50/50 blend of diesel/SFO, Linseed oil... soybean oil, sunflower oil, cottonseed oil, rapeseed oil, peanut oil,... castor oil). (6) International Harvester 284D, peak power (4 fuel oils). (7) International Harvester smoke density at torque loading (4 oils). (8) Iodine number of a range of vegetable and other oil. Iodine number relates the tendency of a thin film of the oil to form a skin. (Ascending: Coconut oil, babassu oil, beef tallow,... sunflower oil, soybean oil, safflower oil, linseed oil, sardine oil).

Note: This is the earliest English-language document seen (May 2007) that uses the word "vegoil" to refer to vegetable oil. Address: Principal Research Scientist, Div. of Mechanical Engineering, Commonwealth Scientific and Industrial Research Organization (CSIRO), P.O. Box 26, Highett, Victoria, 3190, Australia.

855. Fernando, L.H. 1980. Cereals and pulses as sources of food. *Alafua Agricultural Bulletin (Apia, Western Samoa)* 5(4):12-14. Oct/Dec. [3 ref]

• ***Summary:*** "In terms of edible dry weight more than two-thirds of the world's nutritional requirements of human food is supplied by the cereals. Of the proteins supplied, half is contributed by the cereals, as compared with less than one-third from animal sources. The rest of the proteins for humans is derived largely from pulses.

"Cereals and pulses are therefore important in human nutrition. For this reason their possible value supplementing root crops in the South Pacific is worthy of consideration. At the outset, however, I should acknowledge traditional attitudes to cereals and pulses in this region and possible causes underlaying apparent indifference to these foods in countries other than Fiji... Pulses such as soyabean, peanut, pigeon pea, cowpea and winged bean are promising, except that crops such as peanut are eaten by rodents before harvest. The pulses will supply much needed protein, cheaper than from animal sources." The author then discusses three cereals (maize, sorghum, and rice) and four pulses (soyabean, peanut, winged bean, and cowpea).

Concerning the soyabean: It "is the most important of the pulses, followed by the peanut... There is a range of soyabean varieties and some of these are well adapted to tropical conditions. A few varieties have been grown very successfully at the University of the South Pacific School of Agriculture at Alafua in 1979 and experiments are being continued. The crop takes three months from sowing to harvest, the plant sheds its leaves, and the stem with the pods can be uprooted. Cultivation is easy, and like other legumes, nitrogen-fixing bacteria of the Rhizobium type that are found in the root nodules are able to fix atmospheric nitrogen, thus saving expenditure that would otherwise be necessary for nitrogenous fertilizer. Soyabean is now the most important source of vegetable oil; soyabean milk is a substitute for cows milk, particularly where cattle rearing is not a practice. After extraction of oil, the residual cake is a high-protein food or feed." Also discusses: Peanut, winged bean, and cowpea.

Note: This is the earliest document seen (March 2010) concerning soybeans in Samoa (formerly Western Samoa), or the cultivation of soybeans in Samoa. This document contains the earliest date seen for soybeans in Samoa (April 1979), or the cultivation of soybeans in Samoa (1979, probably in about April). The source of these soybeans was Sri Lanka. In April 1979 L.H. Fernando brought 3 varieties of soyabeans (Bragg, PB1, and Improved Pelican) from Sri Lanka to Western Samoa. Address: Head, Crop Production Dep., USP [Univ. of the South Pacific] School of Agriculture, Box 890, Apia, Western Samoa.

856. Skurray, G.; Cunich, J.; Carter, O. 1980. The effect of different varieties of soybean and calcium ion concentration on the quality of tofu. *Food Chemistry* 6(2):89-95. Dec. [8 ref]

• ***Summary:*** A slight variation in the texture of tofu was due to the 7S and 11S proteins in the soybean but an important factor affecting the texture of tofu was found to be the amount of calcium ions added during processing. The firmness and coarseness of the product increased with increases in the amount of calcium ions added and a linear relationship was found between the protein content of the beans and the calcium sulphate concentration required for good quality tofu. Address: School of Food Sciences, Hawkesbury Agricultural College, Richmond, NSW 2753, Australia.

857. *Soya Bluebook.*1980-1994. Serial/periodical. St. Louis, Missouri: American Soybean Assoc. Called Soybean Blue Book from 1947-1966; Soybean Digest Blue Book from 1967-1978; Soybean Digest Bluebook in 1979; Soya Bluebook from 1980 to 1994.
• ***Summary:*** A directory and information book (general and statistical) for the soybean production and processing. In 1987 the *Soya Bluebook* contained seven major sections: Organizations (incl. Associations), Soy Directory (Crushers, Soyfoods, Industrial Products), Soybean Manufacturing Support Industries, Marketing and Auxiliary Services, Soy Statistics, Glossary, Standards and Specifications. Well indexed, with color maps. In the early 1980s the Bluebook started to include many more foreign soyfood manufacturers.

The book contains many tables, including: "World Soybean Production," which gives area and production in specified countries (1974-1980). In 1980 this included: North America: Canada, Mexico, United States. South America: Argentina, Brazil, Bolivia, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay. Europe: Bulgaria, France, Hungary, Romania, Spain, Yugoslavia, Soviet Union. Africa: Egypt, Ethiopia, Nigeria, South Africa, Tanzania, Uganda, Zaire. Asia: Burma, China (Mainland), Taiwan, India, Indonesia, Iran, Japan, Kampuchea, Korea (north), Korea (South), Philippines, Thailand, Turkey, Vietnam. Oceania: Australia. World total.

In early 1988 the American Soybean Association sold the *Soya Bluebook* to Soyatech, owned by Peter Golbitz. His first print run was 8,800 copies. Yellow pages were added. In Dec. 1989 Soyatech announced that in 1988 estimated readership was 10,265 in 55 countries. 33.6% of the buyers were soybean processors / manufacturers, 28.7% were importers, exporters, transporters or marketers, 15.0% were suppliers of soybean processing or handling equipment and manufacturing support services, 9.9% were consultants, booksellers, or periodicals, 8.7% were organization or government agencies, and 4.1% were colleges, universities, libraries, and information centers. By region, 64.3% were sold in North America, 15.2% in Europe, 9.1% in Asia / Pacific / Oceania, and 9.1% in Latin America.

The 1991 Soya Bluebook appeared in Aug. with a new larger (8½ by 11-inch) format and 264 pages. The indexing system is more complete and the pages are tabbed for easy access to each section. The "reference" section was expanded by adding nutritional information on soyfoods, a new chart of soyfoods products, and soybean oil trading standards.

Health Foods Business. 1992. Nov. p. 218. *Soya Bluebook* now reports its circulation to be 3,000.

Talk with Joy Froding of Soyatech. 1995. Jan. 12. The 1994 print run of Soya Bluebook was 2,300 copies. An estimated 4 people read each copy.

Price of the Soya Bluebook (1 book sent to USA, Canada, or Mexico): 1992 = $28 (if paid before June 1; $38 afterward). 1993 = Same price. 1994 = $38 (no prepayment discount; Available July 1994; this book has fold-out indexing tabs and 272 pages. The order form announcing the '94 Soya Bluebook states: "For 47 years Soya Bluebook has served as *the* noted information source for the world's soybean industry"). Starting in Jan. 1994 four issues of *Bluebook Update* are available free of charge to all who subscribe to or are listed in *Soya Bluebook.* 1995-96 = $38 ($48 after 1 June 1995; then in Nov. 1995 the price is raised to $58; incl. indexing tabs, 292 pages). This 1995-96 issue is titled "Soya Bluebook Plus: the annual directory of the world oilseed industry." Crops featured on the front cover are "soya, corn, cottonseed, palm, canola, rapeseed, and sunflower." Address: St. Louis, Missouri; Bar Harbor, Maine (After Jan. 1988).

858. **Product Name:** Tempeh.
Manufacturer's Name: Bodhi Farm Tempeh Co.
Manufacturer's Address: 2480 Channon, NSW, Australia.
Date of Introduction: 1980.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: John Seed. Shurtleff & Aoyagi. 1985. History of Tempeh. p. 32. This was one of the first two tempeh shops in Australia.

859. **Product Name:** Tempeh.
Manufacturer's Name: Dharma.
Manufacturer's Address: c/o Earth Foods, 308 Bronti Rd., Waverley, NSW, 2024, Australia. Phone: 994-505.
Date of Introduction: 1980.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: Swami Veetdharma. Shurtleff & Aoyagi. 1985. History of Tempeh. p. 32. This was one of the first two tempeh shops in Australia.

860. Keogh, R.C.; Deverall, B.J.; McLeod, S. 1980. Comparison of histological and physiological responses to *Phakopsora pachyrhizi* in resistant and susceptible soybean.

Transactions of the British Mycological Society 74(2):329-33. *
• ***Summary:*** "Cuticular epidermal penetration and death of the penetrated cells were similar in two soybean cultivars. Although subsequent hyphal branching and growth decreased, the retention of typan blue stain increased in the resistant cultivar. No uredinia formed in the resistant cultivar. Phytoalexin formation began earlier in the resistant cultivar and at a time when many cells had changed in their physiology as revealed by stain retention. An extract of germinated uredospores caused rapid browning and phytoalexin formation in pods of the resistant cultivar" (from AVRDC 1992, #208). Address: 1. Australia.

861. McLean, R.J.; Byth, D.E. 1980. Inheritance of resistance to soybean rust. *Soybean Rust Newsletter* 3(1):15-17. *

862. Roberts, I.M.; Bain, R.A.; Saxon, E.A. 1980. Japanese agricultural policies: Their origins, nature and effects on production and trade. *Bureau of Agricultural Economics, Australia, Policy Monograph* No. 1. *

863. **Product Name:** Sanitarium Health Foods Soyalac Double Strength Liquid (Soymilk).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia.
Date of Introduction: 1980.
Ingredients: Water, soy oil, sucrose, soy isolate, corn syrup, dextrin, dicalcium phosphate, potassium citrate, lecithin, potassium chloride, calcium carbonate, magnesium phosphate, L-methionine, carrageenan, salt, ascorbic acid, ferrous sulphate, choline, inositol, zinc sulphate, d-alpha-tocopherol, vitamin A palmitate, niacinamide, cholecalciferol, calcium pantothenate, manganese sulphate, cupric sulphate, thiamine HCL, riboflavin, pyridoxine HCl, folic acid, potassium iodide, vitamin K, cyanocobalamin, biotin.
Wt/Vol., Packaging, Price: 375 ml can.
How Stored: Shelf stable.
Nutrition: Diluted 1:1: Protein 2.1%, fat 3.8%, carbohydrate other than lactose 6.6%, ash 0.5%.
New Product–Documentation: Soya Bluebook. 1980. p. 51. Letter from Sanitarium Health Food Co. 1981. Label. 10 by 3.5 inches. Full color with yellow background. Photo shows baby drinking from a bottle. "Specially formulated for milk allergies."

864. Singh, P.K. 1980. Study of soyabean at Alafua: Report on practical work for the degree of Bachelor of Agriculture, University of the South Pacific. BA thesis. *
• ***Summary:*** Soybean yields were found to be dependent on the number of pods per plant.

865. Campbell, L.C.; Sale, P.W.G.; Carter, O.G. 1980. Soybean production in Australia (Abstract). In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Abstracts. Boulder, Colorado: Westview Press. 124 p. See p. 101.
• ***Summary:*** Prior to the late 1960s attempts to establish soybeans as a commercial crop were unsuccessful due to low and unreliable yields. But following integrated soybean research programs on the East Coast of Australia in the late 1960s, appropriate cultivars and farming techniques were determined. The national average of 770 kg/ha (11.3 bu/acre) in 1967-68 doubled to 1,516 kg/ha (22.5 bu/acre) in 1977-78.

Soybean production in Australia is unique in that at least 80% of the crop is grown under irrigation or supplemental irrigation. In 1977-78 it was estimated that more than 73,000 tons of soybeans were produced in Australia. There is presently a demand in Australia for approximately 80,000 tons of soybean meal and 48,000 tons of soy oil. A crop of 100,000 tons (an increase of 37%) would supply the nation's meal requirement, with the shortfall of oil being supplied by imports. Any additional production would have to be exported as whole soybeans, since facilities for exporting meal are limited.

Australia's domestic requirement for soybean meal will probably be supplied by locally grown soybeans within the next few years. Australia will not be able to greatly expand soybean production, as Brazil has, due to the unreliability and lack of suitable summer rain over most of the country, and the lack of irrigation resources. Address: Dep. of Agronomy and Horticultural Science, Univ. of Sydney, NSW, Australia 2006.

866. Carter, O.G.; Skurray, G.R.; Cunich, J.; Honey, S. 1980. Quality assessment of Australian soybean varieties for the production of Japanese foods (Abstract). In: F.T. Corbin, ed. 1980. World Soybean Research Conference II: Abstracts. Boulder, Colorado: Westview Press. 124 p. See p. 35.
• ***Summary:*** Japan imports 3,600,000 tonnes (metric tons) of soybeans each year for use as food and crushing. Previous studies have shown that the ratio of 7S to 11S proteins and the ratio of phosphorus to nitrogen are important in determining the texture of tofu. However this study shows that these ratios are not as important as the amount of calcium sulfate used as a tofu coagulant. Variation in the first two ratios could be counteracted by changing the amount of calcium sulfate used. Address: Hawkesbury Agricultural College, Richmond, NSW 2753, Australia.

867. Claydon, Alan. 1980. The use of legumes as sources of edible oil (with special reference to winged bean). In: Proceedings of Legumes in the Tropics. Serdang, Selangor,

Malaysia: Faculty of Agriculture, Universiti Pertanian Malaysia. xi + 488 p. See p. 473-77. [18 ref]
• ***Summary:*** Contents: Introduction. Four oil-containing crops: Groundnut, soyabean, winged bean, bambara groundnut *(Voandzeia subterranea* (L.) Thou). Chemical and nutritional data on the four oils and their seed cakes. Commercial potential of the oilseed legumes. Address: Dep. of Chemistry, Univ. of Papua New Guinea.

868. Corbin, Frederick T. ed. 1980. World Soybean Research Conference II: Abstracts. Boulder, Colorado: Westview Press. 124 p. Conference held 26-29 March 1979 at North Carolina State Univ. Author index. 24 cm.
• ***Summary:*** The World Soybean Research Conference II was held on 26-29 March 1979 at North Carolina State University. This volume contains summaries of the more than 200 papers, both invited and contributed, presented at that meeting. The full proceedings contains 74 of the invited papers in full.

Contents: Keynote addresses. Mineral nutrition. Engineering. Nitrogen fixation. Entomology. Utilization. Breeding. Physiology. Production. Protein and oil. Plant pathology. Modeling soybean systems. Regional. Agribusiness. Marketing, transport and storage. Weed control. Research techniques. Addendum. Address: Prof. of Crop Science; North Carolina State Univ., Raleigh.

869. Cosgrove, D.J.; Irving, G.C.J. 1980. Inositol phosphates: Their chemistry, biochemistry and physiology. Amsterdam, Oxford, and New York: Elsevier Scientific Publishing Co. xi + 191 p. Index. 25 cm. Series: Studies in Organic Chemistry 4. [350* ref]
• ***Summary:*** Includes details on phytase and phytic acid. Chapter 4 is titled "Inositol hexakisphosphates." Address: CSIRO, Div. of Plant Industry, P.O. Box 1600, Canberra City, A.C.T. 2601, Australia.

870. *Fiji Ministry of Agriculture & Fisheries, Annual Report.*1980. Dry zone. For the year 1978. p. 30. Parliament of Fiji. Parliamentary Paper No. 18 of 1980.
• ***Summary:*** In Part II, Work of the Ministry, in the section titled "Research Division," is a subsection titled "Dry Zone" (p. 30) which discusses numerous crops and contains one paragraph on soybeans: "An Intsoy trial comparing 15 new lines of soyabean gave good results. The nodulation was excellent despite the poor fertility of the soil." Address: Fiji.

871. Mandal, R.; Viner, R.; Chandra, S.; Namoumou, S. (Mrs.); Chanappa, N.; Saua, A. (Miss). 1980. Dry zone research. *Fiji Dep. of Agriculture, Annual Research Report* For the years 1974 and 1975. p. 21-26.
• ***Summary:*** This report on agriculture in Fiji is divided into two parts. The first (p. 1-65) reviews investigations of 1974, and the second (p. 67-141) reviews those of 1975. The section in part one titled "Dry zone crops" (p. 21-26) discusses the following crops that were tested: Peanuts, soyabean, sorghum, sugar cane intercropping, pigeon pea, and duruka.

The subsection on soyabean discusses: Insect control, spacing, variety investigation, time of sowing, seed viability. "Insect control: "Several soyabean trials, especially those intercropped in sugar during 1973, were severely attacked by insects, mainly the agromyzid fly *(Melanagromyza phaseoli)* and the leaf skeletanizer larvae *(Hedylepta diemenalis).* All trials in 1974 had Carbofuran 3G granules (Furadan) applied in the furrow at time of sowing at the rate of 2.24 kg a.i. [active ingredients] per ha and control of these insects was greatly improved.

A trial laid down in February at Dama (Bua) to investigate primarily if the crop would grow well in Talasiga soils, compared four insecticidal treatments factorially with two row spacings..."

"Variety investigation: Fifteen varieties were introduced from Queensland, Australia, and 8 varieties from Beltsville [Maryland], U.S.A. and the seed bulked up. The American varieties, although medium to long season in U.S.A., when sown in March under Fiji conditions, all matured within 88 days, having short determinate growth (25-35 cm height at maturity). The 100 seed weight for these lines ranged from 14.9 gm to 20 gm, compared to 12 gm for Ross or Draintree.

"The new Australian lines had a longer maturity period for late February sowing (95-102 days) and were more variable in plant type... See of 23 introduced varieties were further bulked out of season at the Fiji Sugar Corporation REsearch Station, Lautoka, using a 2 hour night break." Address: Dry Zone Crops Div., Fiji Dep. of Agriculture.

872. Singh, S.R.; Kamath, M.K.; Bedford, G.O.; Uluinaceva, J.; Chandra, V.; Autar, M.L.; Lal, S.N.; Misikini, J.; Sharma, S.D. 1980. Plant protection: Entomology. *Fiji Dep. of Agriculture, Annual Research Report* For the years 1974 and 1975. p. 53-57.
• ***Summary:*** This report on agriculture in Fiji is divided into two parts. The first (p. 1-65) reviews investigations of 1974, and the second (p. 67-141) reviews those of 1975. Both sections on plant protection discuss soybeans.

The section titled "Control of the Bean Fly, *Melagromyza phaseoli* (Diptera: Agromyzidae)" (p. 53-55) states: "The bean fly, *Melagromyza phaseoli*, causes severe damage to soyabean in Fiji. Though the fly has been recorded for a long time, it had never appeared as a major pest until recently when soyabean planting was extended at Legalega." Insecticide trial were conducted using 6 insecticides at several concentrations and two dose rates. They are applied both as granules and as sprays. Two tables show the results. Using soil treatment with granular insecticides, Carbofuram 3% gave the best results (57.0%

mean infestation and 639 kg/ha mean yield). None of the spray treatments worked well; they were too phytotoxic. Address: Fiji.

873. Viner, R.; Vesper, S.; Saua, A. (Miss); Prasad, M.; Chinappa, N.; Nath, R.; Chandra, S.; Namoumou, S. (Mrs). 1980. Dry zone crops. *Fiji Dep. of Agriculture, Annual Research Report* For the years 1974 and 1975. p. 97-102.
• ***Summary:*** This report on agriculture in Fiji is divided into two parts. The first (p. 1-65) reviews investigations of 1974, and the second (p. 67-141) reviews those of 1975. In part two, the section titled "Dry zone crops" (p. 97-102) discusses the following crops that were tested: Sorghum, soyabean, peanuts, cowpea, mung bean, pigeon pea, and duruka.

The subsection on soyabean discusses: Variety trial, disease trial, location plot, time of sowing investigation, and herbicide investigation. "Investigations were continued screening new introductions from the U.S.A. against existing Australian lines. A drought in January affected the trial" as did herbicide drift. The following were tested in the variety trial: FDA 18984, Ross, Daintree, FDA 18988, FDA 18974, FDA 18980, Davis, Bragg, Ranson, and Hill. The American varieties are not suited to January sowing (they produce short, early maturing plants), but earlier planting may not be practical under Fiji conditions.

The following were tested in the disease trial (mainly against Bacteria Pustule–*Xanthomonas phaseoli* var. sojense): K53, Daintree, 71-10, Ross, 49-38, 49-8, 16285, Avoyelles, 71-20, Mamloxi, 16284, Hernon 49, Semster (white flowers), K162, Semster (purple flowers), Hardee, Hampton, Picket.

"Location plot: Three promising varieties were sown at 18 sites on farms and stations in Vanua Levu and Viti Levu [Fiji's two main islands] in January and early February. Basal fertilizer dressing was applied before sowing and carbofuran was placed in the furrow at sowing. The mean yield at all sites and the best location yield (in kg/ha) were: Ross (557 / 1,100). Daintree (575 / 1,331). K53 (528 / 1,392).

"Soyabean requires a high level of management together with assured dry weather during the seed maturity period. Several trials that showed great promise during the early stages, suffered excessively with pod rotting resulting in low returns." Best yields were obtained from late December to early January sowings. Address: Fiji.

874. Burdon, J.J.; Marshall, D.R. 1981. Evaluation of Australian native species of *Glycine* for resistance to soybean rust. *Plant Disease* 65(1):44-45. Jan. [16 ref]
• ***Summary:*** Discusses resistance to soybean rust, *Phakopsora pachyrhizi*. Address: 1. Queen Elizabeth II Research Fellow; 2. Principal Research Scientist. Both: CSIRO, Div. of Plant Industry, Canberra City, 2601, A.C.T., Australia.

875. **Product Name:** Tofu.
Manufacturer's Name: Homeland Foundation.
Manufacturer's Address: Upper Thora, Bellingen, NSW 2492, Australia. Phone: 066-558-514.
Date of Introduction: 1981. January.
New Product–Documentation: Letter from Mareea Newman Weber of Sydney. 1981. Nov. 8. Gives the address of Homeland Community, Upper Thora, Bellingen 2454 NSW, Australia.

Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Owner: David Wilson.

Interview with Jonathan Gordon of White Wave, Inc. 1995. Nov. 16. Jonathan left Findhorn in March 1981 and arrived in Australia in about July or August 1981. He traveled in Australia with a girlfriend and lived at the Homeland Foundation in Upper Thora, Bellingen, New South Wales, where he made tofu with other members of the community. Upper Thora is a little town in the Bellingen (pronounced BEL-ing-un) valley. Some community members had already been making tofu for a long time before he arrived; the tofu company was a completely established local business, with customers and delivery routes, when he arrived. They made about 300 lb/week of tofu and delivered it themselves to nearby communities in insulated cold boxes (called "Eskis," short for Eskimos) in a van. Homeland was also making tempeh at the time, but Jonathan was not a tempeh maker. He left Australia in about Dec. 1981 to return to England.

876. **Product Name:** Tempeh.
Manufacturer's Name: Homeland Foundation.
Manufacturer's Address: Upper Thora, Bellingen, NSW 2492, Australia. Phone: 066-558-514.
Date of Introduction: 1981. January.
New Product–Documentation: Interview with Jonathan Gordon of White Wave, Inc. 1995. Nov. 16. Jonathan traveled to Australia in March or April 1981 and lived at the Homeland Foundation in Upper Thora, Bellingen, New South Wales, where he made tofu with other members of the community. Homeland was also making tempeh at the time Jonathan arrived but he was not a tempeh maker and he does not remember the tempeh maker's name. He left Australia in about Dec. 1981 to return to England. Jonathan thinks their food plant did not have a name separate from the name of the Homeland Foundation. They did not package their tempeh. They just used to take it around in their own van to people's houses and little food shops. But he may be able to find out. His close friend at Homeland, Karen James (an American), is now in California and she may remember; she worked more extensively in the food area than Jonathan did.

Talk with Karen James White, now living in Santa Fe, New Mexico. 1997. March 12. Karen recalls that she arrived at Homeland Foundation in either late December 1981 or early 1982. It was located about 40 miles inland from Coffs Harbour, in a lush, fertile green valley–perhaps 40-50 miles from the nearest neighbors. At that time the community was making and selling tempeh, and the shop (which also made tofu–in the same room as the tempeh–and sprouts) almost certainly had a name. She worked in the tempeh shop during her 3½ month stay at Homeland, where they typically made 30-40 pounds of tempeh per batch using an incubator as big as a refrigerator.

877. Howse, Eric. 1981. Seventh-day Adventist work with soyfoods worldwide (Interview). Conducted by William Shurtleff of Soyfoods Center, Feb. 12. 2 p. transcript.
• ***Summary:*** Howes was the International Director at the General Conference in Washington, DC, until he retired. Soyfoods are a rapidly growing component of Adventist food work worldwide. Discusses: Sanitarium Health Food Co. in Australia, DE-VAU-GE in West Germany, Granose Foods in England. A major new component is low-cost extruders making TVP. Address: 6471 Penn National Drive, Fayetteville, Pennsylvania 17222. Phone: 717-352-7239.

878. **Product Name:** Tofu Spreads [Teriyaki, or Curry].
Manufacturer's Name: Harvest Wholefoods.
Manufacturer's Address: 403 Richmond Rd., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1981. February.
Ingredients: Tofu, tamari, garlic vinegar.
Wt/Vol., Packaging, Price: 200 gm plastic tub.
How Stored: Refrigerated.
New Product–Ducumentation: Chalmers, Elizabeth. 2007. Jan. 16. "Business history of the Chalmers family: Making soyfoods in New Zealand" (Interview). Letter (e-mail) from Elizabeth Chalmers. 2007. Jan. 24. Harvest Soyfoods made "Tofu Spread" in two flavors, Teriyaki and Curry. Teriyaki sold best. Ingredients: Tofu, tamari, garlic, vinegar. They were sold in 200 gm small plastic tub, refrigerated. Bean Supreme discontinued them. "We did actually start to make these again when we started the Organic Soy Company, but only for about 6 months, as we could not get a long enough shelf life out of them–only 2 weeks. All our products (except Teriyaki sauce) have always been refrigerated. New Zealand has a population of 4 million in a country the size of the whole United Kingdom. Because of these logistics we are always 'playing to a small audience,'" and need to send our products to all corners of the country. Hence we need to get a shelf life of 6-8 weeks out of all of our products. If we were just to sell locally in Auckland, it would not be enough business to keep us going."

Letter (e-mail) from Elizabeth Chalmers. 2007. Jan. 24. "Now that I really set me mind to it, I think we started making the spreads before we made Tempeh. I would take a guess at early 1981, February, when we were still in the back of Harvest Wholefoods.

879. John, Harrison W. 1981. Adventist food industries: Recent developments. *Spectrum: Journal of the Association of Adventist Forums* 11(3):28-36. Feb.
• ***Summary:*** One of the most informative articles ever written about Seventh-day Adventist food companies worldwide. "Ever since Ellen G. White's health reform message of 1863, Seventh-day Adventists have had a 'theology' of nutrition." In 1979 food sales for Adventist manufacturing and marketing companies totaled $188 million, up 95% over 1974 sales of $96 million, and up 3.68 times over 1970 sales of $51 million. The most successful company is Sanitarium Health Food Company in Australia. Sales for the 5-year period 1975-75 totaled $400 million. Their most popular product is read-to-eat "Weet Bix," a breakfast cereal that outsells Kellogg's Corn Flakes.

In Europe: Earned income figures for 1978 were impressive. DE-VAU-GE's income was $12.2 million (second only to Sanitarium Health Foods in Australia). Nutana's was $7.6 million ($10 million in 1979), and Granose's was $1.8 million. Nutana showed an impressive tenfold sales increase from 1973 to 1979.

Profit figures, however, were not impressive. In 1978 Granose lost about $295,000 and Nutana $5,903. DE-VAU-GE's profits were unknown. Granose had been a consistent money looser; between 1975 and 1978 it lost an average of $101,000 a year and its net worth decreased from $331,902 in 1975 to $113,515 in 1978. Thus in October 1979 Sanitarium Health Foods of Australia was asked to take over the management of ailing Granose. Loma Linda Foods in the USA has also had problems. Though 1978 sales were $11.7 million, they lost $390,000. In April 1980 management and control of LLF was transferred to Sanitarium of Australia. In about 1978 Granix in Argentina and Superbom in Brazil entered the vegetable protein market with TVP and are currently producing 700 tons/year. In 1976 a "World Foods Service Expansion Program" was started to finance expansion of food production into countries having serious nutritional problems. Low-cost extrusion cookers making TVP were a key part of this program. Address: Rockville, Maryland.

880. Hicks, Alastair. 1981. Re: History of the full-fat soy flour factory in Thailand. Letter to William Shurtleff at Soyfoods Center, March 25. 2 p. Typed, with signature on letterhead.
• ***Summary:*** "The full fat soy flour factory in Thailand commenced production of soyflour during commissioning trials which I ran in the week April 24-28, 1978, as food

engineer to the project. The location is Mae Chan, a small village outside Chiang Rai in the far north of Thailand, near the Golden Triangle. The plant was initiated by the ASEAN Sub-Committee on Protein, whose chairman is Professor Amara Bhumiratana, Director of the Institute of Food Research and Product Development (IFRPD), Kasetsart University, Bangkok, Thailand.

"The king of Thailand, King Bhumibol Adulyadej, provided the land and buildings, as part of the Thai contribution to the project. One aim of the Royal Preserved Foods Project is to encourage Hill tribe farmers to grow crops other than opium poppies, in this case, nutritious soybeans, as part of an overall crop substitution program...

"The factory is able to make the following products: cleaned soybeans (up to 3 ton/hour); clean, cracked, debittered soybeans (a possible tempeh raw material); enzyme inactive full fat soyflour. The latter products can be produced at 1.1 tonne/hour. Enzyme active products could also be produced. Most of the full fat soyflour is utilized in the production of Kaset Infant food, a baby food produced at the I.F.R.P.D. in Bangkok. This product in turn is supplied to the hundreds of baby health centers throughout Thailand.

"For further information on these and other details, I suggest you write to Professor Amara... Meanwhile, I would like you to record the Department of Food Technology, Hawkesbury Agricultural College of Advanced Education, Richmond, N.S.W., Australia, as a center for soyfoods processing and research in Australia.

"We have an ongoing program of agricultural research in soybean varieties suitable for the Asian market. Related to this we have developed tofu trials and soybean canning trials. Presently we are developing soymilk from full fat soyflour and tempeh as a soyfood in Australia." Address: Lecturer, Dep. of Food Technology, Hawkesbury Agricultural College, Richmond, NSW 2753, Australia. Phone: (045) 701 333.

881. Fenwick, Dorothy E.; Oakenfull, D.G. 1981. Saponin content of soya beans and some commercial soya bean products. *J. of the Science of Food and Agriculture (London)* 32(3):273-78. March. [23 ref]

• ***Summary:*** The saponin content for various soybean products, in grams per kg of dry weight, is as follows: whole soybeans 56, defatted soy flour 22-25, soya hulls 20, soy protein isolate (Promine D 3, GL-750 8, Maxten C 19, Maxten E 25), lecithin (Crown 53, Vitaplex 29), tofu 21. Some manufacturers use ethyl alcohol extraction to prepare soy protein concentrates; this process removes a substantial portion of the saponins. Address: CSIRO Div. of Food Research, P.O. Box 52, North Ryde, NSW 2113, Australia.

882. **Product Name:** Nectar Tempeh.
Manufacturer's Name: Nectar Tempeh. Later? changed to Nectar Soy Products.
Manufacturer's Address: 4/13 Glamis St. (P.O. Box 969), Geelong, VIC, 3220, Australia. Phone: 05-221-4458.
Date of Introduction: 1981. March.
New Product–Documentation: Letter and order for *The Book of Tofu, The Book of Tempeh,* and *Tofu & Soymilk Production* from Mike Manser and Ralph McCay. 1979. Aug. 30. They have two addresses: One is shown above. The other is 4/13 Glamis St., Newtown, VIC 3220.

Letter from Darren Fletcher of Darkville, Melbourne. 1984. Sept. 4. Another soyfoods business in Melbourne is Nectar Tempeh, P.O. Box 969, Geelong. Phone: (052) 214458.

Shurtleff & Aoyagi. 1985. Jan. Soyfoods Industry and Market. p. 9. Letter (fax) from Ross Hamilton and Mike Manser. 1990. Sept. 13. This was the company's first product, introduced in March 1981.

883. **Product Name:** Tempeh.
Manufacturer's Name: Harvest Wholefoods.
Manufacturer's Address: 403 Richmond Rd., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1981. April.
Ingredients: Whole soybeans, water, culture *(Rhizopus oligosporus).*
Wt/Vol., Packaging, Price: 250 gm plastic bag.
How Stored: Frozen.
New Product–Documentation: Chalmers, Elizabeth. 2007. Jan. 16. "Business history of the Chalmers family: Making soyfoods in New Zealand" (Interview). Letter (e-mail) from Elizabeth Chalmers. 2007. Jan. 23. This tempeh was not made with organic soybeans. "In 1981 you could only get 2 things in New Zealand that were organic–wheat & rye. We didn't start using organic soybeans until we started the Organic Soy Company in 1996. We always made tempeh in perforated plastic bags, then packaged it in another labeled plastic bag. We sold it frozen. The typical weight was 250 gm. We got our spores from Betty at GEM Cultures. We learned how to make tempeh from *The Book of Tempeh,* by Shurtleff & Aoyagi." As far as Elizabeth knows, this was the first tempeh made and sold commercially in New Zealand. "There was a Dutch Indonesian guy who used to do Indonesian food from his home, and he made a bit of tempeh, but as soon as we started making it he stopped, as it was too much work on top of his meals."

884. Hofman, Vern; Kaufman, Ken; Helgeson, Delmer; Dinusson, W.E. 1981. Sunflower for power. *North Dakota State University of Agriculture and Applied Science, Cooperative Extension Service, Circular* AE-735. 9 p. April

• ***Summary:*** Contents: Introduction. Sunflower oil properties. Diesel engine tests. Sunflower oil extraction. On-farm sunflower oil expeller costs. Feed value of sunflower seed and meal. Sunflower meal and biomass. Fuel for America's farmers. Other research results.

The researchers in this project used three different blends (75%, 50%, and 25% sunflower oil with #2 diesel fuel); they got good results even though they did not use esters. They used screw expellers to extract the oil mechanically. "A great deal of attention is being focused on biomass from agricultural crops" (p. 7). They explain why returning to the use of horses is not feasible. Work horses require a tremendous amount of food. "Studies in the 1920s determined that about 33% of the and area was needed to produce feed for the horses." "Estimates state that approximately 61 million horses would be needed to produce the crops grown in 1975." About 31 million workers would be need to care for these horses, but there are presently only 4 million workers on farms (p. 7).

Under "Other research results," we read (p. 9): "The Republic of South Africa Department of Agriculture and Fisheries has done considerable work with sunflower oil as a fuel." "The South Africans have also run preliminary tests using methyl ester as a fuel for approximately 100 hours at 80 percent power. The results indicate a very good performance, less exhaust smoke than diesel and increased engine thermal efficiency." The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Victoria, Australia, is also researching vegetable oils for use in diesel engines. Address: 1. Extension Agricultural Engineer; 2. Asst. Prof., Agricultural Engineering; 3. Prof., Agricultural Economics; 4. Prof., Animal Science.

885. Ochi, H.; Blenford, D.E. 1981. The soy sauce explosion. *Food Technology in Australia* 35(5):242, 244. May.

• ***Summary:*** This is a reprint of an article with the same title first published in August 1980 in *Food Processing Industry* (UK). Address: Nikken Food Co., Tokyo, Japan.

886. Photographs of Paul Duchesne and Peter Wiegand making tofu at Wildwood Natural Foods in Fairfax, California. 1981. Fairfax, California.

• ***Summary:*** These three color photographs (each 3½ by 5 inches) were taken in mid-1981 at the Wildwood Natural Foods tofu shop in Fairfax. They show: (1) The entire shop, including the red tile floor, taken from the back of the shop look out through the three big windows onto the street. On the windows, in large gold letters, is written "Wildwood Natural Foods." In the foreground are the mill and cooker. Near the windows are yellow soybeans soaking in buckets, a curding vat on wheels, a stainless steel sink, and Peter watching Paul cut tofu. (2) Paul, dressed in a white apron and tank-top white shirt, examining curds and whey in the curding barrel. He holds a stainless steel paddle in his right hand and his left hand rests on the rim of the vat. Peter is standing facing the camera, holding a stainless steel can of nigari, wearing high boots, a white apron, and a Tofu t-shirt. (3) Paul placing a cake of tofu into a bucket of water for delivery. The shop window and a stainless steel sink are in the background.

A fourth photo, black-and-white Polaroid, shows Michael Pierce, standing by a steaming cooker. The caption: "My first batch of tofu."

887. Sims, R.E.H. 1981. Tallow, rapeseed oil, and their esters as diesel fuel extenders–Preparation of tallow and rapeseed oil esters. A preliminary report. Palmerston North, New Zealand. June. *

• ***Summary:*** Sims reports on his work making esters from vegetable oils in New Zealand, and indicates that he and Dr. Roger Korus at the University of Idaho were in correspondence regarding work on the development of ester fuels. Early use of word "Biodiesel."

Note: Since 1979 the Univ. of Idaho has been involved with studying the use of vegetable oils as alternative fuel sources. Address: Agronomy Dep., Massey Univ., Palmerston North, New Zealand.

888. Smith, Paul. 1981. Re: Pioneering work with debittered full fat soy flour and with soybeans in Australia. Soybean production in Australia. Letter to William Shurtleff at Soyfoods Center, undated. 2 p. Handwritten. Plus comments on draft of History chapter.

• ***Summary:*** Comments on "History of Soya in Australia" manuscript: Vincent R. Smith was a soyfoods pioneer in Australia. In 1951-52 he began to manufacture Australia's first whole (full-fat) heat-treated (debittered) soy flour. From 1953-54 to 1974-75 V.R. Smith also canned soybeans in tomato sauce or puree. In 1956 he founded Soy Products of Australia Pty. Ltd. Between 1965 and 1974-75 Mr. Smith developed and manufactured two soyabean meat substitutes–Soya Bean Luncheon Loaf, and Savoury Roast–for Bellevue Health Supplies, as part of his product range within F.G. Roberts' Health Foods Proprietary Ltd. This latter company has since been absorbed within Soy Products of Australia Pty. Ltd. Technically and nutritionally these products were excellent, but they were discontinued due to rising labour costs, the small Australian market, and competition from larger, more highly automated companies like Sanitarium and Heinz. At the time, possibly due to the very cheap cost of meat in Australia, there was very little market interest in soyabeans either as a food, meat substitute, and/or extender.

By 1981 Soya Products of Australia Pty. Ltd. was making debittered full-fat soy flour and grits, Soy Crunch (a breakfast cereal containing soy grits), Soy Compound (containing dry soymilk, whole soy flour, malt, and lactose), and several types of Muesli containing soy grits. The company's main role is in supplying high grade, human consumption quality raw (enzyme active) and debittered (heat-treated) soy grits and soy flour to industry [food processors] for a wide variety of uses: cakes, biscuits, bread, bread premixes, pizzas, breakfast cereals and mueslis, hamburgers, smallgoods, baby foods, soy milk, soy ice cream, tofu, and calf- and piglet rations.

Interest in soyfoods is growing in Australia, and will continue to grow fostered by increasing health consciousness and the rising prices of meats of all kinds. After the end of the Vietnam war in 1975, there was a big influx of Vietnamese into Australia, swelling the number to 50,000, of which 30,000 are ethnic Chinese. There are also some 10,000 Indonesians currently residing in Sydney alone.

Letter: "Thank you for your hospitality during my visit to the USA... We are now more than fully occupied running, maintaining, and expanding our soy flour mill and our health food business. In the last two years we have made substantial improvements in our quality control, throughput, and heat-treatment process. We have also been working on improving our bulk unloading and grain cleaning system, and plans for extending and further automating our plant are well in hand... We are actively participating in research and development work on soy flour and its end uses: particularly in the areas of liquid and powdered soymilks and soy ice cream.

"We were amongst the first people in Australia to use soya beans to make products for human consumption, in particular heat-treated or debittered full fat soy flour. We were actively involved with the first commercial crops of soybeans grown in Australia in the early 1950s at Kingaroy; we even had a plot of several varieties of soyabeans growing in our own backyard for several years from about 1953-55. Though the bushes grow, the soybeans never mature properly. We also did some interesting work in canning beans in tomato sauce or purée and in manufacturing soy meat substitutes. In addition to our conventional bakery and small goods outlets, our own specialty products and breakfast cereals, we are now supplying several small manufacturers of tofu, soymilk with soybeans, soy flour (raw), and soy grits (raw) and have recently become involved in tempeh manufacture. The trend here in Australia is definitely following that in the USA and interest seems to have grown dramatically in the last year or so. Soyfoods seem to have taken off... Unless you can afford shiploads, freight to Australia is a killer, so we do our best to avoid importing soybeans.

"I am enclosing a recent newspaper article about a tofu producer. We supply him with soy flour for making his tofu and soymilk."

Concerning soyabean production in Australia: "Soyabeans are widely grown in Australia from just north of Shepparton in Victoria (120 miles north of Melbourne), through the Riverina district of southern New South Wales (NSW), through central, north, and northeastern NSW; the Darling Downs area (around Toowoomba) and Kingaroy districts of Queensland. More recently soyabeans have been grown in Western Australia, near Perth. (See map. p. 14).

"A great deal of work has gone into developing suitable varieties of soyabeans for Australian conditions; much of this has been built on American research and experience. U.S., Chinese and Australian beans, while generally similar, are very different to handle and process, in our experience.

"Initially, soyabeans were grown under natural rainfall but this is now rare as bean size tends to be small and yield poor. Soyabeans are definitely not suited to dryland farming techniques. Nearly all soya beans now grown in Australia are grown under irrigation."

Update (March 1995): Paul Smith joined this family-run company in April 1980. In 1981 he was just starting to learn about its history. By 1986 he had done extensive research and writing (which see) on the company history, which showed that it had much earlier and very interesting origins. Address: Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

889. Buss, Dale D. 1981. Fake food: To dairymen's dismay, imitation cheeses win growing market share. Makers of pseudo varieties claim dietary benefits; A major issue: 'Realness.' Learning margarine's lesson. *Wall Street Journal.* July 20. p. 1, 13.

• ***Summary:*** The eight U.S. makers of imitation cheese also dominate America's production of real cheese. The nation's 330,000 milk producers are concerned. Last year synthetic cheeses grabbed at least 5% of the $4,500 million U.S. cheese market, up from 2% in 1978. Dairy officials predict imitations will capture more than 15% of the U.S. cheese market by 1985, and could take up to half by the year 2000. One reason for concern is that cheese is the only cow-derived product besides yogurt that has shown substantial growth in the last 10 years in America. Per capita cheese consumption rose to 17.8 lb in 1980 from 11.5 lb in 1970 and from 7.7 lb in 1950.

Imitation cheeses are based on casein (a milk protein), all of which is imported, mostly from Australia, New Zealand, and Western Europe. Casein is not made in the U.S. and probably won't be in the near future. Most imitation cheese are much less expensive than real cheese and contain less cholesterol and fat, fewer calories, but equivalent nutrients.

"Because of its wide use in pizzas, Mozzarella is the most popular imitation cheese so far. U.S. pizza makers fill about a quarter of their cheese requirements with imitations, saving 25% to 50% of what real cheese would cost per pound."

The first imitation cheese in America, a mock Mozzarella, was introduced by Anderson Clayton & Co. in 1973. Now the company makes 20-30 million lb of imitation cheese a year, or 15-20% of the U.S. market. Most of this goes into its New Age-brand line of sliced American-cheese imitations. Borden Inc., Amfac Inc. and Universal Foods Corp. of Milwaukee, Wisconsin, also make American-type fake cheeses.

Note: Talk with Dick Johnson of Anderson Clayton Foods. 1990. June 29. Anderson Clayton started development of engineered cheeses at their R&D center in 1969. Like most imitations, their first product was based on casein; it contained no soy. This product was launched in 1973 under the "Unique Loaf" brand. A little later an American flavor was also introduced. The company wanted to avoid "Imitation Cheese" in the product name.

Note: This is the second earliest document seen (April 2001) that contains soy cheese industry or market statistics or trends–by geographical region. It gives statistics on imitation cheeses in the United States. However, soy is not mentioned. Address: Staff reporter.

890. Cain, Elly. 1981. From Australia: Soysage rolls join the take-out menu. *Soyfoods* No. 5. p. 43. Summer.
• ***Summary:*** On Queensland's Sunshine Coast north of Brisbane, soysage is being used to make meatless alternatives to traditional favorite dishes: Sausage rolls (seasoned pork sausage wrapped in cylinders of pastry) and Cornish pasties (meat and vegetables folded in a circle of pastry). Photos show: Cheryl Grimshaw rolling out the pastry dough for her soysage rolls in Yandina. Many of the cylindrical and turnover-shaped (half circle) soysage rolls. Address: Australia.

891. Oakenfull, D. 1981. Saponins in food–A review. *Food Chemistry* 7(1):19-40. July. [83* ref]
• ***Summary:*** Saponins are surface active sterol or triterpene glycosides. They occur in a large number and a wide variety of plants but only about 28 of these are regularly used as food by man. The more commonly eaten of these are soybeans, chick peas, peanuts and spinach. The presence of saponins in plant extracts is readily indicated by their haemolytic activity and ability to form stable foams in aqueous solution, but for unambiguous identification, it is essential to use thin layer chromatography. Although saponins have antibiotic activity and are toxic to fish and insects, they appear to be practically nontoxic to man. Dietary saponins, either isolated or as saponin-containing food plants, lower plasma cholesterol levels in several mammalian species. They are therefore probably important in human diets to reduce the risk of coronary heart disease. In soybeans the saponin content (% dry weight) is 5.6. Dietary saponins reduce plasma cholesterol concentrations in animals (Newman et al., 1957; Griminger & Fisher, 1958). Address: CSIRO Div. of Food Research, P.O. Box 52, North Ryde.

892. Wagner, Martha. 1981. Soy down under. *Soyfoods* No. 5. p. 11-12. Summer.
• ***Summary:*** First discusses the work of Marcea Weber and Debbie Schmetzer in Australia. Marcea Weber owns The Soybean Factory located just outside of Sydney, Australia. Debbie, formerly a tofu maker at Surata Soyfoods in Eugene, Oregon, is now living in New Zealand, where she plans to start a soyfoods business. "Marcea, originally from New York, began her tofu business three years ago, about a year after arriving in Australia from England where she operated a small natural foods bakery. Koreans and Chinese were already producing large volumes of tofu in Australia but her business was the first to produce a nigari tofu. After three years, tofu is still quite foreign to Australians, Marcea says...

"The Soybean Factory sells to natural food stores, restaurants, and juice bars. It produces only 600 half-pound blocks a week. Using simple Takai machinery with a 45-gallon Australian pressure cooker, only 30 pounds are produced in each batch so the selling cost is high, about double U.S. prices, and much higher than Korean and Chinese tofu sold in Australia." "The factory employs three production workers and a manager. Marcea does the promotion. She also spends much of her time teaching cooking and nutrition classes at the East-West (Macrobiotic) Center, which she and her husband, Daniel, an acupuncturist, established when they arrived in Australia."

In New Zealand, "no one outside the Chinese community had even heard of tofu until an Auckland health food store, Harvest Whole Foods, began producing it in a backroom kitchen last October [1980]. The enthusiasm for tofu was shown by several restaurants doing an alternative lifestyle festival, which featured tofu burgers, has produced healthy sales for the shop. The three owners, Greg and Ricky Chalmers and Ricky's wife, Elizabeth, are producing about 170 to 299 kilos (374 to 440 pounds) of tofu a week. They expect sales to grow and are planning to expand production facilities."

Debbie Schmetzer arrived in New Zealand in Jan. 1981 with her husband, Peter (who was born in New Zealand) and their young son. She describes the process and ingredients used to make tofu at Harvest Health Foods, then notes that "Even in the Chinese community, only two Chinese restaurants are making tofu. Harvest's main customers are Indonesians, vegetarians, people switching from dairy to soy on the advice of naturopathic doctors, and spiritual seekers such as Hare Krishna and Divine Light people." On the Run is a fast food deli that makes excellent tofu dishes in Auckland, including tofu burgers, curried tofu salad in pita bread, and tofu tacos with locally made tortillas.

Letter from Martha Wagner. 1981. July 24. "Before this article went to press I learned that Debbie and her husband had become disillusioned with attitudes in New Zealand toward food and organic agriculture, red tape, and toward setting up business–especially concerning a mold to make tempeh. So they took off for greener pastures in Australia. They are now mulling over the scene in the Melbourne are and may well do a bagel business combined with a soy deli. She would be a good person for a soyfoods information center there. Address: 35 Flower Street, Essendon 3040 Victoria, Australia.

"For the addresses of the Koreans and Chinese making lots of tofu in Australia, contact Marcea Weber, 29 Belmore St., Rozelle 2039, NSW.

"Did you meet the Australian couple Fred and Radhika Koch at the SANA conference? They are planning to set up a good size tofu operation as a support for a 26-person community in the country." Address: USA.

893. Shurtleff, William; Aoyagi, Akiko. 1981. History of Loma Linda Foods. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 8 p. Oct. 4. Unpublished typescript.
• ***Summary:*** A comprehensive history of the subject. Contents: Background. Early years (1906-1937): Sanitarium Food Co. (1905-06); first soyfoods (copied from Van Gundy): Smokene (1921), tofu, soymilk, and soy sandwich spread (1933-34); no one at Loma Linda knows how these foods originated. New plant (1938-1950): Started 1938 under Chapman, World War II years. The 1950's: Acquisition of Dr. Harry Miller's company, International Nutrition Laboratories (1951). The 1960's. The 1970's and 1980's: Many new products from 1972, products in 1981, 1980 takeover by Sanitarium Health Foods Co. of Australia, present. Address: Lafayette, California. Phone: 415-283-2991.

894. Shurtleff, William; Aoyagi, Akiko. 1981. History of overseas Adventist food companies. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 8 p. Oct. 7. Unpublished typescript.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: Start by Miller, rapid growth, extruders, new soymilk, future priorities. Asia. Australia and New Zealand: Before 1954, first soyfood in 1954, recent. Europe. Latin America. Africa. Address: Lafayette, California. Phone: 415-283-2991.

895. Ontos Yogaville. 1981. Tofu, Ontos style. *Ziriuz (Australia).* Oct. p. 21.
• ***Summary:*** This spiritual community is planning "construction of a tofu-making building. We are planning to supply East Gippsland and Melbourne with this wonderful food. This will provide an important source of income to the community, and provide a real service to those foods to better their diet." Address: Buchan, 3885, Australia. Phone: 051 55 0215.

896. Taufa, Kilioni. 1981. Study of soyabean varieties, plant growth and yield: A report submitted as part of the requirement for the Diploma in Tropical Agriculture of the South Pacific Regional College of Tropical Agriculture. BA thesis. 20 p. Oct.
• ***Summary:*** Contents: Introduction. General (From Hinson & Hartwig, 1977): Germination, plant growth, genetic traits of agronomic importance. Climatic requirements: Temperature, photoperiod response, soil, soil management, water and water management. Experiment: Preparation of the trial area, experimental design, plant spacing, planting date, design. Growth and development: Population density, varieties, culture, pest management, weeds, disease, insects (esp. Southern green stinkbug–Nezara viridula (L.)), harvesting. Result. Discussion. Conclusion. Acknowledgement.

Soybean yields were found to be dependent on both the seed number and seed size. "As part of the three years course for Tropical Agriculture Diploma, students are required to spend their final year in operating a trial on a particular topic in Agriculture and to write and to write and submit a report... My supervisor for the whole [soyabean] trial was Dr. Fernando.

"Because of its high protein and oil content for stock and human nutrition, the possible importance of soyabean (Glycine max) for the South Pacific Territory was discussed by Dr. Fernando in 1979.

"Seeds were brought from Sri Lanka by Dr. Fernando, Senior Lecturer in Crop Production at the University of the South Pacific, in April 1979. The seeds were of three varieties: Bragg (large seed), PB-1 (Medium sized seed and light hilum), and Improved Pelican (small seed and dark hilum)... These varieties have been grown very successfully at the University of the South Pacific School of Agriculture at Alafua in 1979 and experiments are being continued."

The author planted his first seeds on 14 April 1981, and again on 28 April. Photos show the plots. "The first harvest was done on 18 July (88 days from emergence) and the second was done on 20 July (90 days from germination). The final harvest was on 3 August (86 days from emergence)." A table (p. 14) shows the mean weights of seed per plant and mean weights of 100 seeds, for all 3 varieties. The average weight of Improved Pelican seeds was about 11.5 gm (small), PB-1 15.5 gm, and Bragg 19 gm (large). Address: Alafua School of Agriculture, Western Samoa.

897. Weber, Marcia. 1981. Re: New developments with tofu and tempeh and Australia. Letter to William Shurtleff at Soyfoods Center, Nov. 8. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "Here in Sydney there are only two other major producers of Bean Curd. They are both Chinese and are very enterprising.

"Our factory has shut down, and now one of the Chinese producers [Sin Ma Trading Co., 9 Meeks Road, Marrakville, NSW] is allowing us to use their premises to make our tofu... We are hoping to start another factory with more capital behind us. Unfortunately, we were grossly undercapitalized, and this was our downfall. The demand here in the healthfood line has stabilized at about 600 [pieces of tofu] weekly. Many people buy the Chinese bean curd, because they don't know the difference. When they experience our brand, they realize that there is a vast difference.

"However, it is impossible to compete with the price; our Tofu is twice the price. Because our volume is so low, we have very little choice. I myself teach cooking, and try to promote it as much as I can... Don't forget that this whole country is only 13 million people. It's very small compared to the U.S."

Gives addresses for Castle Trading Pty. Ltd. in Ranwick NSW, Homeland Community in Bellingen NSW, Sin Ma Trading Co. in Marrakville NSW, and Elly & Cyril Cain in Eumundi. The latter are just starting tempeh making on a very small scale. Address: East West Foundation of Australia, Suite 507, 363 George Street, Sydney 29 5481, Australia.

898. Wiegand, Peter. 1981. Re: Starting Auenland Tofu in Germany. Letter to Michael Pierce at Wildwood Natural Foods, 135 Bolinas Rd., Fairfax, California, Nov. 9. 1 p. Handwritten, with signature. [Eng]

• ***Summary:*** This letter is written on an artistic letterhead showing a green tree-vine growing up the right side and part way across the top. The paper is light gray. In the lower left is a little green house with a shale roof and a blooming tree by the chimney.

In Germany, things are going pretty well for Peter and his wife, Elgard. A few days ago they settled in a beautiful place in the mountains. Winter time has already started and all of nature has fallen asleep, but life keeps the Wiegands very busy. Peter has already gotten a room for the "Tofu Kitchen." After Christmas they want to start getting it ready to make tofu. They invite Michael to come to Germany, and to pay his way. "So give our love to Wildwood and to Craig the gardener, and give the other letter to him."

Note: This is the earliest document seen (Oct. 2000) concerning Auenland Tofu in Germany.

Talk with Michael Pierce of Georgia. 2000. Oct. 11. Craig was an organic gardener in Marin, California. They used to take all of Wildwood's okara over to Craig's garden and compost it for the community garden. Peter was a musician, and he also made candles. Michael is quite sure Peter did not illustrate this letterhead. Address: Hub Bleimhaus, D-8210 Prien-Chiemsee, West Germany.

899. **Product Name:** Tempeh.

Manufacturer's Name: Beancoast Soyfoods.

Manufacturer's Address: Eumundi P.O. c/o C. Cain, Eumundi, QLD, 4562, Australia. Phone: 071-470-189.

Date of Introduction: 1981. November.

New Product–Documentation: Letter (order form) filled out by Mrs. Elly Cain (324 Grant Ave., Syracuse, New York 13207). 1979. Sept. 26. She orders 1 copy of *The Book of Tempeh* (professional hardback edition).

Letter from Marcea Weber. 1981. Nov. 8. Elly & Cyril Cain (Nambour P.O., Eumundi, 4560 QLD) are just starting tempeh making on a very small scale. Soyfoods Center Computerized Mailing List. 1982. July 23. Owners: Elly & Cyril Cain.

Letter from Ken Alexander of Daylesford, Australia. 1982. Oct. 21. "Cyril and Ellie Cain have gradually built up a tempeh business, supplying Brisbane [in Queensland]. Cyril makes beautiful tempeh. As he is selling the business to a private family concern, the situation is too tight for me to be included, otherwise Cyril would gladly share his experience with me. Cyril needs a successful sale, so as to return to the United States with his family."

Letter from Michael Joyce (which see). 1983. March 5. Gives a brief history of Cyril and Elly Cain's pioneering work with tempeh in Australia.

Letter from Michael Joyce. 1984. Oct. 25. "I believe Cyril and Elly Cain made the first commercial tempeh in Australia, commencing in July 1982, as Beancoast Soyfoods, Maroochydore, QLD. Julie and I started working with them in October 1982 and we bought the company in May 1983. In October 1983 we changed the name to Mighty Bean Soyfoods and moved from Maroochydore to Cooloolabin via Yandia, Sunshine Coast, Queensland 4558. We make 100-300 kg/week."

Vicki Jackson. 1983, Nov. The Squirrels Cook Book Brisbane. On p. 94 starts chapter titled "Tempeh" written by Julie and Michael Joyce. They note: "Little did we know in early 1982, when we first ate tempeh made by Cyril & Ellie Cain of Eumundi, Sunshine Coast, that we were soon to become tempeh makers."

Shurtleff & Aoyagi. 1985. History of Tempeh. p. 32. This company was founded by Cyril and Elly Cain in July 1982.

900. Judy, W.H.; Jackobs, J.A.; Engelbrecht-Wiggans, E.A. 1981. International soybean variety experiment: Sixth report of results, 1978. *INTSOY Series* No. 21. Nov. xi + 305 p. (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** In the ISVEX trials, soybeans were tested in the following regions and countries: Africa: Algeria, Botswana, Cameroon, Egypt, Ethiopia, Gabon, Ghana, Malawi, Morocco, Rwanda, Senegal, Somalia, Sudan, Tanzania, Upper Volta, Zaire, Zambia, Zimbabwe.

Asia: Bangladesh, Taiwan, India, Indonesia, Korea, Malaysia, Nepal, Pakistan, Sri Lanka, Thailand.

Europe: Italy, Poland, Portugal.

Mesoamerica: Costa Rica, Dominican Republic, Guatemala, Honduras.

Middle East: Iran, Iraq, Saudi Arabia, Turkey.

North America: United States.

Oceania: Fiji, Tahiti.

South America: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, French Guiana, Paraguay, Peru, Venezuela.

Results of the first ISVEX trials in Morocco are reported. Soybeans were grown at three sites: (1) Berkane. Date planted: 22 May 1978. Cooperator: M.A. Yacoubi. Best yield: Harcor 3,724 kg/ha. (2) Gharb. Date planted: 13 May 1978. Cooperator: M.A. Yacoubi. Best yield: Elf 3,046 kg/ha. (3) Tadla. Date planted: 12 June 1978. Cooperator: Nadah Driss. Best yield: Crawford 3,370 kg/ha. Address: Univ. of Illinois, Urbana.

901. **Product Name:** Tofu.
Manufacturer's Name: Sin Ma Trading Co.
Manufacturer's Address: 9 Meeks Rd., Marrickville, NSW, Australia.
Date of Introduction: 1981. November.
New Product–Documentation: Letter from Marcea Weber. 1981. Nov. 8. They are allowing us to make tofu at their plant. Marrickville is in is the southwestern part of Sydney.

902. **Product Name:** Tofu.
Manufacturer's Name: Castle Trading, Ltd.
Manufacturer's Address: 93 Belmore Rd., Randwick, NSW, Australia.
Date of Introduction: 1981. December.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Dec. 8.

903. Gutierrez, J.; Etienne, J. 1981. Quelques données sûr les acariens *Tetranychidae* attaquant les plantes cultivées au Senegal [Some data on the tetranychid mites attacking cultivated plants in Senegal]. *Agronomie Tropicale* 36(4):391-394. Oct/Dec. [12 ref. Fre]
Address: 1. Entomologist, ORSTOM, New Caledonia; 2. Entomologist, IRAT, Senegal.

904. Hume, D.J. Jackson, Ann K.H. 1981. Pod formation in soybeans at low temperatures. *Crop Science* 21(6):933-37. Nov/Dec. [16 ref]
• ***Summary:*** Most soybean varieties stop forming pods at temperatures around 15ºC. This is a report of cold-tolerant varieties that form pods at day / night temperatures as low as 15 / 9ºC. Address: 1. Prof., Crop Science Dep., Univ. of Guelph, Guelph, ONT, Canada; 2. Science technician, Plant Physiology Div., Dep. of SIR, Palmerston North, New Zealand.

905. **Product Name:** Tofu.
Manufacturer's Name: Protein City.
Manufacturer's Address: 22 Lombard St., North Adelaide, SA 5006, Australia. Phone: 082-673-635.
Date of Introduction: 1981. December.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Owner: Terrell & Laryssa Neuage. They are located in the state of South Australia.

Letter from Terrell and Laryssa (28 Lombard St.). 1982. Aug. 21. They plan to visit the USA in Sept. and Oct. to visit as many tofu producers, nationwide, as possible. "The last year has been a very frustrating year for us. No one that we've contacted seems to know anything about soyabeans, except for yield and acreage. I have called and written departments of agriculture and schools, etc.–no one has responded to anything beyond acreage and yield. I believe that the Chinese tofu makers here use beans from China, as that is what they have offered us... We look forward to seeing you."

906. **Product Name:** Tofu.
Manufacturer's Name: Vegetable Protein Co.
Manufacturer's Address: 53 Thomas St., Unley 5061, Australia.
Date of Introduction: 1981. December.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Owner: David Hammond.

907. White, Arthur L. 1981-1986. Biography of Ellen G. White. 6 vols. Washington, DC, and Hagerstown, Maryland: Review and Herald Publishing Assoc. 6 vols. Illust. 23 cm. *
• ***Summary:*** This biography, considered the best to date of Ellen G. White, was written by her grandson, Arthur. Ellen apparently never used the word "gluten" in her own writings. This word "gluten" appears in connection with her, in her biography, Vol. 4, p. 433. Her biographer quotes an article from the *Union Conference Record* (a Seventh-day Adventist publication in Australia) of 1 Dec. 1899, to show what products are being made by the Sanitarium Food Co. in Australia. "They are now manufacturing granose biscuits, granose flakes, bromose, nuttose, antiseptic tablets [charcoal tablets], granola, caramel cereal [grain coffee], nut butter, wheatmeal biscuits, gluten biscuits, and gluten meal."

908. **Product Name:** Bonsoy (Soymilk).
Manufacturer's Name: Bean Supreme (Importer). Made in Japan by Marusan. Imported via Muso Shokuhin.
Manufacturer's Address: New Zealand.
Date of Introduction: 1981.

Ingredients: Water, soybeans, pearl barley, kombu (sea vegetable), barley malt.
New Product–Documentation: Talk with Yuko Okada. 1992. July 16. Muso first exported Bonsoy soymilk to Bean Supreme in about 1981. This soymilk was packaged in a foil retort pouch.

909. Bickerstaffe, R. 1981. Amino acid composition of some New Zealand animal feedstuffs. *New Zealand J. of Science* 24(3-4):281-86. *

910. **Product Name:** Wonder-Vite Firm Tofu.
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia. Phone: 077-745-926.
Date of Introduction: 1981.
New Product–Documentation: Manufacturer's catalog. 1981, undated. Soyfoods Center Computerized Mailing List. 1983. June 20. Owner: C.H. Lee.

911. **Product Name:** Wonder-Vite Deep-Fried Tofu.
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1981.
New Product–Documentation: Manufacturer's catalog. 1981, undated.

912. **Product Name:** Wonder-Vite Super Soy Burger.
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1981.
New Product–Documentation: Manufacturer's catalog. 1981, undated.

913. **Product Name:** Wonder-Vite Dip-N-Joy (Non-Dairy Soy Ice Cream) [Carob, or Vanilla].
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1981.
New Product–Documentation: Manufacturer's catalog. 1981, undated.

914. **Product Name:** Wonder-Vite Nu-T-Boy Soynuts [Salted, or Unsalted].
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1981.
New Product–Documentation: Manufacturer's catalog. 1981, undated.

915. Burdon, J.J.; Marshall, D.R. 1981. Inter- and intra-specific diversity in disease response of *Glycine* species to the leaf rust fungus *Phakopsora pachyrhizi*. *J. of Ecology* 69(2):381-90. *
• ***Summary:*** Discusses resistance to soybean rust.

916. Goss, Barry Andrew; Giles, David E.A. 1981. Comparative modelling of price determination and storage in United States and Australian commodity markets: soybeans and wool. *Working Paper, Dept. of Econometrics and Operations Research, Monash Univ.* No. 6/81. 37 p. Also published as Dept. of Economics Seminar Papers No. 8/81. [10+ ref]*
Address: Clayton, VIC, Australia.

917. IRAT, France. 1981. Rapport annuel 1980 [Annual report 1980]. Paris: IRAT (Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres). xxvii + 256 p. [4 ref. Fre]
• ***Summary:*** The section titled "Soybeans" *(Le Soja)* (p. 93-111), after the Introduction, reports the results of: Varietal improvement: Genetic resources, criteria for selection, selection, varietal evaluation. Conditions and methods of soybean seed storage. Inoculation: Dosage of liquid inoculum, types and storage of inoculum, graph of number of nodules vs. dosage, production of inoculum, survival of Rhizobium bacteria, interaction of inoculation x variety. Mineral nutrition and fertilizers: Organic matter, phosphates. Cultivation techniques: Density of planting, date of planting. Control of pests, diseases, and weeds. Production systems. Publications. Soybeans were grown and research conducted in the following countries and areas: Senegal, Cameroon, Benin, French Guiana *(Guyane)*, Ivory Coast, Upper Volta, Togo, Madagascar, and [French] Polynesia (Papara station, in Tahiti). Varieties mentioned include: Amsoy, Coker 240, Forrest, Hardee, IAC 2 (Brazil), ISRA 26/72, ISRA 44A/73, Jupiter, and Williams.

The introduction discusses world soybean production, which in 1980 was 10% less than in 1979 but 80% more than in 1970. Only four countries produce more than 1 million metric tons of soybeans a year: USA 48.31 million. Brazil 15.128 million. China 13.735 million. Argentina 3.240 million. It is interesting to note that in 1970 Brazil produced only 1.5 million tonnes and Argentina only 40,000 tonnes. The average soybean yield worldwide is 1.5 tonnes/ha. It is about 1.8 tonnes in the USA, Brazil and Argentina.

In 1979 world exports of whole soybeans was 25 million tonnes, with the USA exporting 21 million, Argentina 2.8 million, and Brazil 0.6 million. Soybean production in Africa is 240,000 tonnes, of which 75,000 tonnes comes from Nigeria. Nevertheless, projects for the development of soybean production are underway in several other African countries: Madagascar, Cameroon, Togo, and Upper Volta (where this "new product" is used in making a traditional food product). Address: 110, rue de université, 75007 Paris 550.32.10, France.

918. McCormick, S.J.; Anderson, J.A.D. 1981. Soybean cultivars better suited to the New Zealand climate. In: Proceedings of the 11th Annual Conference of the Agronomy Society of New Zealand. See p. 69-72. Held 11-13 Aug. 1981 at Palmerston, New Zealand. *

919. McLean, R.J.; Byth, D.E.; Langdon, R.F.N.; Ogle, H.J. 1981. Investigations of differential host reaction to soybean rust *(Phakopsora pachyrhizi).* In: Australian Oil Seeds and Protein Grains Research Conferences. Queensland: University of Queensland. 2 p. *

920. McLean, R.J. 1981. Studies in resistance in soybean *(Glycine max* (L.) Merr.) to rust *(Phakopsora pachyrhizi* Syd.). PhD thesis, University of Queensland. xii + 443 p. * Address: Queensland, Australia.

921. Quick, Graeme R. 1981. A summary of some current research on vegetable oils as candidate fuels for diesel engines. In: Northern Agricultural Energy Center (NAEC). 1981. Vegetable Oil as Diesel Fuel, Seminar II. Peoria, Illinois: NAEC-CCRC. Held 21-22 Oct. 1981, Peoria, Illinois. *
Address: Principal Research Scientist, Div. of Mechanical Engineering, Commonwealth Scientific and Industrial Research Organization (CSIRO), P.O. Box 26, Highett, Victoria, 3190, Australia.

922. **Product Name:** Sanitarium Health Foods Textured Vegetable Protein TV [Flavour-Like Beef, Flavour-Like Fish, or Minced].
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1981.
Ingredients: 1990: Soya flour, vegetable oil, salt, Savex, artificial flavour.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable.
New Product–Documentation: Letter from Sanitarium Health Food Co. 1981. Label. 10 by 4 inches. Full color. Photo shows round slices or minced chunks on a bed of rice. "Just heat and eat."

Letter and Labels sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1981, and address as Sydney, N.S.W.

923. **Product Name:** Soy Compound.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1981.
Ingredients: 1995: Soy, lactose, malt.
Wt/Vol., Packaging, Price: 1 kg plastic bag.
How Stored: Store in a cool, dry, dark place.
New Product–Documentation: Letter from Paul Smith of Soy Products of Australia Pty. Ltd. 1981. This company makes Soy Compound (containing dry soymilk, whole soy flour, malt, and lactose). Letter from Paul Smith. 1995 April 1. p. 5. It appears that Soy Compound, as it is now known, evolved out of Malto-Soy Drink and Soy Milk Compound, both of which were launched in Sept. 1939; their lack of popularity was partly die to the poor quality and flavour of some of the imported soy used and there being no chocolate or roasted chicory added to mask the flavour.

924. **Product Name:** Hing's Tofu.
Manufacturer's Name: Sun Hing Foods Co.
Manufacturer's Address: 147 Onepu Rd., (P.O. Box 14-213, Kilbirnie), Lyall Bay, Wellington 3, New Zealand. Phone: (04) 877 313.
Date of Introduction: 1981.
New Product–Documentation: Letter from Alan Tam of Hing's Tofu, 275 Cuba St., Wellington, New Zealand. 1985. May 1. "We have been makers of tofu for many years now, initially on a small scale, only making it for friends and family. But in recent years, with growing awareness of health and nutrition among the general public, there has been growing demand for tofu in Wellington. This has led us to making tofu on a commercial scale, supplying the local health food stores, restaurants, and the local community in general. After reading your book, *The Book of Tofu,* I am very impressed at the extent of your research into tofu and soybean foods, its historical, cultural, and nutritional aspects. I also find your recipes very interesting, covering a wide range of tastes and exploring many new ways of eating tofu. In fact it is the most comprehensive book on soyfoods that I've ever seen!" He asks about ordering the book *Tofu & Soymilk Production.*

Letter from Alan Tam, Owner. 1986. Nov. 18. He has just moved into new premises, so this address is probably incorrect. Current production is about 1,000–1,200 lb/week of tofu. Leaflet. 1986. Hing's Tofu. Brown and blue on white. Contains 18 recipes, nutritional analysis and illustrations from *The Book of Tofu* by Shurtleff and Aoyagi.

Letter from Alex Leung, Director. 1992. Dec. 9. The company is now named Hing's Limited, located at 147 Onepu Road, Kilbirnie, Wellington, New Zealand.

Note: This is the earliest known commercial soy product made in New Zealand.

925. Beech, Donald F.; Lawn, R.J.; Byth, D.E. 1981. Soybean research under irrigation in Northern Australia. *INTSOY Series* No. 20. p. 123-28. W.H. Judy and J.A. Jackobs, eds. Irrigated Soybean Production in Arid and Semi-Arid Regions (College of Agric., Univ. of Illinois at Urbana-Champaign). [4 ref]
• ***Summary:*** This report is about research conducted at the Kimberley Research Station on the Ord River Scheme, located in the northeastern part of Western Australia (15°39' south latitude). In this monsoonal zone, irrigation is essential for high, dependable crop yields. Seed yields of up to 2,500 kg/ha have been obtained commercially using the variety Ross and line 49-38. Research suggests that seed yields in excess of 4,000 kg/ha are obtainable.

Most soybean production in Australia is restricted to the subtropical areas (25° to 33° south latitude) on the east side of the country. Address: CSIRO Div. of Tropical Crops and Pastures, Australia; Univ. of Queensland, Australia.

926. Chapman, David Kenneth. 1981. The potential distribution of rainfed soybean production in Australia. M. Agr. Sci. thesis, University of Queensland, Brisbane, Australia. 47 p. Illust. 30 cm. *
Address: Univ. of Queensland, Brisbane, Australia.

927. *Fiji Ministry of Agriculture & Fisheries, Annual Report.* 1981. Research Division: Stations. For the year 1979. p. 38. Parliament of Fiji. Parliamentary Paper No. 14 of 1981.
• ***Summary:*** The Legalega Station, at Nadi, has as its main functions research on the following crops: Pigeon pea, soybean, other leguminous crops, peanut, and sorghum. Address: Fiji.

928. Judy, W.H.; Jackobs, J.A. eds. 1981. Irrigated soybean production in arid and semi-arid regions: Proceedings of a conference held in Cairo, Egypt, 31 August–6 September 1979. *INTSOY Series* No. 20. ix + 194 p. (College of Agric., Univ. of Illinois at Urbana-Champaign). [150+ ref]
• ***Summary:*** Contents: Foreword. Conference participants (directory of 50 people). Opening addresses to conference (4). Conference papers (24). Country reports (7). Constraints to effective irrigated soybean production (4 papers). Conference summary.

Note 1. Most of these papers are cited separately. Note 2. This conference was sponsored by the Egyptian Ministry of Agriculture, Menoufeia University, and the International Soybean Program (INTSOY), in collaboration with the Food and Agriculture Organization of the United Nations (FAO) and the U.S. Agency for International Development. Address: Univ. of Illinois, Urbana.

929. Meilke, Karl D.; Griffith, G.R. 1981. An application of the Market Share Approach to the demand for soyabean and rapeseed oil. *European Review of Agricultural Economics* 8(1):85-97. [23 ref]
• ***Summary:*** The authors use this approach to estimate demand for total vegetable oils and soybean oil in the USA, Canada, Japan, and the European Community (EC), and rapeseed oil in Canada. The results imply that the demand for rapeseed oil is more elastic than the demand for soybean oil in all regions, and that the demand for both rapeseed and soybean oil is by far the most elastic in the EC. Address: 1. Univ. of Guelph, ONT, Canada; 2. New South Wales Dep. of Agriculture, Australia.

930. Pate, J.S.; Kuo, J. 1981. Anatomical studies of legume pods–A possible tool in taxonomic research. In: R.M. Polhill and P.H. Raven, eds. 1981. Advances in Legume Systematics. Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AR, England. xvi + 1049 p. 2 parts. See p. 903-12. Part 2. [14 ref]
• ***Summary:*** Contents: Introduction. Layers of the pod wall. Features of the exocarp. Features of mesocarp. Special features of the endocarp. Conclusion. Address: Botany Dep., Univ. of Western Australia, Nedlands, Western Australia.

931. Raven, Peter H.; Polhill, R.M. 1981. Biogeography of the leguminosae. In: R.M. Polhill and P.H. Raven, eds. 1981. Advances in Legume Systematics. Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AR, England. xvi + 1049 p. 2 parts. See p. 27-34. Part I. [14 ref]
• ***Summary:*** "The legumes of Australasia are of particular biogeographical interest. New Guinea has a relatively rich flora of legumes consisting of 80 native genera and about 370 species (about 180 endemic), with a strong development of species in genera such as *Archidendron, Maniltoa* and *Mucuna*, but no endemic genera (Verdcourt, 1979). Its legume flora is largely derived from tropical Asia. Southern New Guinea shares 34 species with tropical Australia, mostly ruderal herbs, but a few forest trees and lianes of widespread genera, and a few elements clearly derived from Australia: *Vandasia* (monotypic, also Queensland), *Gompholobium nitidum* (1 of 25 species, also known from Queensland), and seven species of phylodic *Acacia* (all common to Australia, out of a total of some 800 species there). The entire legume flora of New Guinea probably entered from the Miocene onward, following the collision of the Australian Plate with Asia some 15 m.y. BP [million years before the present] (Raven & Axelrod, 1974). The very few legumes of Australian derivation in New Guinea, on the other hand, probably arrived there during or after the Pleistocene, when direct overland connections existed."

Note: *Webster's Dictionary* defines ruderal (an adjective derived from the New Latin *ruderalis*, which is from the Latin *ruder- rudus* = rubble), a word first used in about 1858, as "growing where the natural vegetational cover has been disturbed by man (ruderal weeds of old fields and roadsides)." Address: 1. Missouri Botanical Garden, St. Louis, Missouri, USA; 2. Royal Botanic Gardens, Kew, Richmond, England; 2. Missouri Botanical Garden, St. Louis, Missouri, USA.

932. Thompson, John A. 1981. Systems of soybean production including rotations and multiple cropping. *INTSOY Series* No. 20. p. 111-16. W.H. Judy and J.A. Jackobs, eds. Irrigated Soybean Production in Arid and Semi-Arid Regions (College of Agric., Univ. of Illinois at Urbana-Champaign). [14 ref]

• ***Summary:*** In New South Wales, Australia, soybeans are usually grown as a full-season, single crop. The harvested area of soybeans grown under irrigation has increased from about 100 ha in 1968 to 15,000 ha in 1979. Over the same period, average yields have risen from 290 kg/ha to more than 2,000 kg/ha. Several large commercial fields averaged 3,700 kg/ha during the recent harvest.

Defines and discusses single cropping, multiple cropping (incl. sequential cropping and intercropping), rotation, and relay cropping. Address: Research Agronomist, Agricultural Research Station, Leeton, New South Wales, Australia.

933. Viner, R.; Prasad, M.; Nath, R.; Kumar, H.; Prasad, R.; Nand, S. (Mrs). 1981. Pulses and dry zone crops. *Fiji Dep. of Agriculture, Annual Research Report* For the year 1979. p. 25-28.

• ***Summary:*** The following pulse and dry zone crops were tested: Soyabean, urd, mung, cowpea, pigeon pea, sorghum, peanuts.

The subsection on soyabeans states: "An Intsoy variety trial was sown at Naiselesele Bua, in February. Yields were low due to poor germination, but the growth habit of several varieties was suited to mechanical harvesting in spite of late sowing. These varieties if sown at high plant populations could give economic yields. The best lines were Williams, SJ-2, Hardee LS, and Improved Pelican. The last was suited for combined harvesting [i.e. harvesting with a combine], but is very susceptible to Bacterial Pustule disease." Address: Fiji.

934. Viner, R.; Prasad, M.; Nath, R.; Kumar, H.; Prasad, R.; Nand, S. (Mrs). 1981. Pulses and dry zone crops. *Fiji Dep. of Agriculture, Annual Research Report* For the year 1980. p. 22-25.

• ***Summary:*** The following pulses and dry zone crops were tested: Soyabean (also spelled "soya beans"), mung, pigeon pea, cowpea, sorghum, maize. Note that testing of peanuts was discontinued.

The subsection on soyabeans discusses: Variety trials, rhizobium trials, variety trial #2, spacing x time of sowing, herbicide trial. "Three Intsoy variety trials were laid out, one at Bua in March, and two at Legalega Station in January and March. There were significant yield differences between treatments within the trials, but in the combined analysis there was no significant difference in yield. Poor seed germination reduced plant stand for some of the more promising lines. January sowing gave higher yields, but seed quality was poor." At Legalega, the highest yields came from Bossier (2,320 kg/ha; Jan. sowing). Rillito (2,080 kg/ha; Jan. sowing). Williams (1,810 kg/ha; Jan. sowing). In a combined analysis of 3 trials, Bossier gave the highest yields (1,450 kg/ha). Address: Fiji.

935. [Japan miso export statistics]. 1981. In: Okura-sho Yushutsu Tsukan Tokei-hyo. Tokyo, Japan.

• ***Summary:*** Gives miso export statistics for 15 countries. For each country gives: 1980 weight and 1981 weight (in kg). Percentage increase. 1980 and 1981 price in yen. Percentage price increase. The top countries, in descending order of amount exported are (with the 1981 weight in kg for each): USA 834,303. Singapore 94,988. Netherlands 67,767. Canada 46,178. England 40,371. West Germany 39,966. Australia 39,432. Iraq 34,509. Indonesia 30,620. Hong Kong 28,940. France 27,959. Belgium 26,625. Taiwan 25,238. Italy 18,755. Saudi Arabia 18,627. Total for all miso exports to all countries 1,524,008. Address: Tokyo, Japan.

936. **Product Name:** Tofu.
Manufacturer's Name: Jon Judson Tofu.
Manufacturer's Address: 142 Easter Crescent, Kew Dunedin, New Zealand.
Date of Introduction: 1982. January.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: Jon Judson.

Talk with Elizabeth Chalmers of The Organic Soy Co., Auckland, New Zealand. 2007. Jan. 15. She, Greg, and Rick Chambers taught Jon how to make tofu. He came to Auckland, worked in the factory, and stayed with Greg. Elizabeth thinks Jon started actually his own company after Oct. 1982.

937. Soyfoods Center. 1982. Tempeh shops in the West. Lafayette, California. 2 p. Jan. Unpublished manuscript.

• ***Summary:*** Lists the name, address, and phone number of 41 tempeh shops in the USA, 3 in Australia, 3 in Canada, 1 in England, 5 in the Netherlands, and 1 in West Germany. Address: Lafayette, California. Phone: 415-283-2991.

938. Wood, Brian J.B. 1982. Soy sauce and miso. *Economic Microbiology* 7:39-86. Jan. A.H. Rose, ed. Fermented Foods. [50 ref]

• ***Summary:*** Contents: 1. Introduction. 2. The preparation of soy sauce: Introduction, preparation of raw materials (the beans, wheat), mixing, koji, moromi. 3. Of beans, microbes, and miso: Beans, microbes, miso. 4. Trade in soy sauce: Introduction, statistics. Table 1 (p. 64-66) shows exports of soy sauce in 1978, in tonnes (metric tons) from Hong Kong, Korean Republic, Singapore, Japan, and total, to almost every country in the world (with each country's population in millions), grouped by region as follows: 1. North America: Canada, USA (#1)–Regional total imports: 6,052.3 tonnes. 2. South and Central America [and Caribbean]: Argentina (#3 in region), Bolivia, Brazil, Chile, Costa Rica, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Mexico (#2), Nicaragua, Panama, Paraguay, Surinam, Venezuela (#1), Granada, Jamaica, Trinidad and Tobago, total. Former Dutch West Indies–Regional total imports: 1,046.4 tonnes. 3. Europe: Austria, Belgium, Czechoslovakia, Denmark, Finland, France (#4 in region), Germany (West #3), Greece, Italy, Netherlands (#2), Norway, Portugal, Spain, Sweden, Switzerland, UK (#1), USSR–Regional total imports: 3,017.7 tonnes. 4. Near and Middle East: Bahrain (#3), Egypt, India, Iran (#2), Iraq, Jordan, Kuwait, Oman, Qatar, Saudi Arabia (#1), United Arab Emirates, Yemen Arab Republic–Regional total imports: 1,193.5 tonnes. 5. Far East and Western Pacific: Brunei, Hong Kong (#3 in region), Indonesia, Japan, Korea (South), Macao, Malaysia (#2), Philippines, Sabah (#1; A state of Malaysia from 1963; Formerly British North Borneo), Sarawak (A state of Malaysia from 1963), Singapore, Taiwan, Thailand–Regional total imports: 3,139.4. 6. Pacific and Australasia: Australia (#1 in region), Cook Islands, Christmas Islands, Fiji, Guam (#2), Nauru, New Caledonia, New Hebrides, New Zealand, Oceania n.c.s. (#3), Papua New Guinea, Portuguese Timor, Samoa and Tonga, Solomon Islands, Tuvalu (Ellis Island), U.S. Oceania–Regional total imports: 1,647.5 tonnes.

Note: This is the earliest document seen (March 2010) concerning soybean products (soy sauce) in Kiribati (Christmas Islands), in Nauru, in Qatar, or in Tuvalu. This document contains the earliest date seen for soybean products in Kiribati (Christmas Islands), in Nauru, in Qatar, or in Tuvalu (1978); soybeans as such have not yet been reported.

7. Africa: Algeria, Canary Islands, Ethiopia, Gambia, Ghana, Kenya, Libya, Malagasy, Malawi, Mauritius (#2 in region), Nigeria, South Africa (Republic of, #1), Sudan, Réunion Islands (#3), Tanzania, Zaire. Other African countries–Regional total imports: 365.7 tonnes. World total imports: 15,731.5 tonnes, of which 6,192.8 tonnes from Hong Kong, 1,233.5 tonnes from South Korea, 1,713.6 tonnes from Singapore, 6,591.6 tonnes from Japan. The value in pounds sterling and in pounds sterling per tons of soy sauce is given for each exporter.

Other tables show: (2) Soy sauce exports (in tonnes and value) each year from 1976 to 1976 from Hong Kong, South Korea, Singapore, and Japan. A large percentage of Hong Kong's exports are re-exports (probably from China). (3) Total soy sauce exports from Japan, 1976-1978, by container type, with amount and value. (4) Soy sauce and miso production in Japan every 5 years from 1965 to 1978 (in tonnes). (5) Soy sauce and miso production in Japan for export in 1976, 1977, and 1978. Miso production (in tonnes) averaged about 40% of soy sauce production, and miso exports (in tonnes) averaged about 13% of soy sauce exports. (6) Imports of soy sauce into Hong Kong, Singapore, and the USA from exporting countries in 1978 (with figures for exports from China in 1976 and 1977). (7) Re-exports of soy sauce (made in China) from Hong Kong and Singapore in 1978 to major importing countries worldwide, by region, by country. Small countries that are the destination of this soy sauce include: Honduras, Nicaragua, Panama, Venezuela, Trinidad and Tobago, Former Dutch West Indies [also called Netherlands Antilles; they are part of the Lesser Antilles and consist of two groups of islands in the Caribbean Sea: Curaçao and Bonaire, just off the Venezuelan coast, and Sint Eustatius, Saba and Sint Maarten, located southeast of the Virgin Islands. The islands form an autonomous part of the Kingdom of the Netherlands], Pakistan, Saudi Arabia, United Arab Emirates, Brunei, Sabah, Sarawak, Fiji, Nauru, Oceanea (non-U.S.), Oceanea (U.S.), Papua, Samoa and Tonga, Solomon Islands, Ghana, Malagasy Republic, Togo. Total from Hong Kong: 2,945.3 tonnes, and from Singapore 109.5 tonnes.

(8) Exports of miso (in tonnes) from South Korea and Japan in 1978 to major importing countries worldwide, by region, by country. The leading importers are: USA (622), Saudi Arabia (353), Singapore (66), Bahrain (64), Netherlands (38), Iran (29), Iraq (29) France (28), German Federal Republic (23), Smaller importers include: Chile, Guyana, Surinam, Bangladesh, Iran, Iraq, Jordan, Kuwait, Quatar, Saudi Arabia, United Arab Emirates, Yemen Arab Republic, Sabah, Fiji, Guam, New Hebrides, Papua New Guinea, Samoa, Solomon Islands, Algeria, Canary Islands, Ghana, Kenya, Libya, Mozambique, South Africa Republic, Zaire.

Note: This is the earliest document seen (June 2007) concerning soybean products (miso) in Quatar. This document contains the earliest date seen for soybean products in Quatar (1978); soybeans as such have not yet been reported.

(9) Exports of miso from South Korea and Japan in 1976, 1977, and 1978 (quantity and value each year; no importing country names are given).

5. Tour of South East Asia: Technical and scientific aspects, trade aspects. 6. Acknowledgments. References

The chapter on Trade states: Soy sauce and soy paste (miso) are traded between all countries of South East Asia. The Korean Republic's exports nearly quadrupled in tonnage. The Kikkoman Company's production facility in Wisconsin produced 21,6000 tonnes of soy sauce in 1978. This was equal to 3 times the total exports from Japan in the same year. Japan's total share of the world soy sauce market remains very healthy. Miso exports are still small in comparison with soy sauce. On a rising market Japan's exports still only represent 0.2% of its annual miso production; "clearly there is considerable room for expansion here."

Miso is of greater relative importance to Korea than it is to Japan. Among the European countries, Belgium and Holland import the greatest amount of miso on a per capita basis. Spain imports a fair amount of miso. The U.S.A. and Canada had total miso imports totaling about 10% of their soy sauce imports.

"In Thailand, there are about 50 soy sauce factories, the majority of which are small, producing less than 100 kilolitres per year, although it should be noted that most of them also produce soybean paste and soybean cheese [probably tofu]. The total annual consumption of soy sauce in Thailand is estimated at about 6,000 kilolitres (about 7,200 tonnes).

"In Malaysia, there are about 140 soy sauce factories producing in total an estimated 5.5 million gallons of soy sauce per year according to the proprietor of a leading brewery in Kuala Lumpur. This is about 21,000 tonnes per annum" (p. 84). Address: Dep. of Applied Microbiology, Univ., of Strathclyde, Glasgow [Scotland], U.K.

939. Nyiakura, Orban. 1982. Soyabean production in Nigeria–prospects and problems. In: A.M. Emechebe and U.R. Pals, eds. 1982. Proceedings of the Second National Meeting of the Nigerian Soybean Scientists. 95 p. See p. 12-18. Held at the Institute for Agricultural Research, Ahmadu Bello Univ., Zaria [Nigeria] 19-20 Feb. 1982. Publication No. II.
• ***Summary:*** "Soyabeans were introduced into Nigeria by the explorers and missionaries. The most popular variety in Benue State (Nigeria) is the Malayan. The work on soyabean in the northern states of Nigeria dates back to 1930 when three varieties were introduced to Samaru from the United States of America. These varieties were later found to be low yielding and ill adapted to the environment of Samaru and were soon discarded. The next introduction of soyabean was made by the Botanist of the then Regional Research Station, Samaru, in 1937 when [varieties named] Malayan, Benares, and Trinidad were brought from Malaya, India and Trinidad, respectively.

"Further introductions continued in the 1940s from East Africa, Sudan, U.S.A., South Africa, Ceylon, the Far-East, Eastern Europe and Australia. These introductions were grown in various observation plots at Samaru and at the Farm Centres throughout the Northern Provinces during the 1950s."

Nigeria is the leading soybean producing country in Africa, and Benue State is the major producer of soyabeans in Nigeria, accounting for over two-thirds of the country's production. In Benue State, soyabean production is concentrated in the Gboko, Kwande, Katsina-Ala, Gwer, and Makurdi areas. Soybean yields are very low compared to other major producing countries; in 1979 they were 385 kg/ha compared with 3,060 kg/ha in Brazil, 2,162 kg/ha in the USA, and 904 kg/ha in China.

Major factors responsible for the decline of the crop in Benue State include marketing, utilization, production, competition from other crops, and international competition. To correct this the Benue State government has initiated an ambitious project for production and processing of soyabeans, rice and maize, which will cost over 100 million naira. The technical partners, Hawaiian Agronomics Company (International) of the USA, have started work on the project already. Address: Hon. Commissioner for Agriculture, Benue State.

940. Shurtleff, William. 1982. Soyfoods: Protein source of the future. *Ziriuz (Australia)*. Feb. p. 7, 9.
• ***Summary:*** An overview of the subject, discussing the many benefits of soyfoods. Address: Lafayette, California.

941. **Product Name:** Tofu, and Soymilk.
Manufacturer's Name: Soyfoods Australia (Renamed Nutrisoy. Pty Ltd. by 1987).
Manufacturer's Address: Rear 355 Parramatta Rd., Leichhardt, NSW 2040, Australia. Phone: 560 0792.
Date of Introduction: 1982. February.
New Product–Documentation: Letter from T. [Tony] Wondal. 1982. Dec. 17 (only stamp-dated envelope survives); Soyfoods Center Computerized Mailing List. 1983. June 20. Owners: Marcea Newman Weber and John Fenwick. Phone: 025-600-792. They make tofu and soymilk.

Letter from Marcea Newman Weber. 1995. Feb. 12. The company moved to 14/2 Paton Place, Manly Vale, NSW 2093 in about 1983, and Pty. Ltd. was added to the company name in about 1984.

Letter from Marcea Newman Weber. 1995. March 3. "We started making tofu in Leichhardt in 1982–first part of the year."

942. Lauser, Greg C. 1982. History of Cargill's involvement in the soybean processing industry. Minneapolis, Minnesota. 5 p. March 15. Unpublished manuscript.

• ***Summary:*** Soybean processing: 1942–Cargill entered the soybean processing business with the acquisition of expeller plants in Springfield, Illinois (sold in 1950), and Cedar Rapids (east), Iowa. Note: These two plants were purchased from Ike Sinaiko and Joe Sinaiko respectively, but probably in 1943.

1943–Cargill acquired Plymouth Processing Company's plant and grain elevator at Ft. Dodge, Iowa (sold in 1971 [to Land O'Lakes]).

1945–The company acquired from Honeymead solvent extraction plants in Spencer and Cedar Rapids (west), Iowa. The solvent-extraction process is used in modern plants today.

1946–Cargill acquired the Washington, Iowa, soybean crushing plant and began crushing flax seed at a plant it built at Port Cargill in Savage, Minnesota. The same year, the company acquired from the Falk Corporation a flax processing plant in Minneapolis. Since 1967, that plant also has been crushing sunflower seeds.

1947–The company opened a soybean crushing plant at Savage, Minnesota.

1950–Cargill built its first plant specifically designed to crush soybeans in Chicago to serve domestic oil and meal markets. In 1956, a refinery was built adjacent to the crushing plant that produces industrial refined non-edible oil used in paints and other protective coatings and in vinyl products. Cargill also acquired a flax crushing plant in Philadelphia that was closed as a crushing plant in 1953.

1957–Cargill opened a soybean processing plant in Memphis, Tennessee. A second plant was added adjacent to the first in 1970.

1959–Cargill expanded the scope of its soybean crushing activities to the Southeast by opening a facility in Norfolk, Virginia, and acquired a plant in Sioux City, Iowa, from Sioux Industries.

1960–The Wichita, Kansas soybean crushing plant was acquired from the Soy Rich Company.

1961–The company acquired the Des Moines, Iowa soybean crushing plant from Spencer-Kellogg Co. In 1967, Cargill opened its first domestic salad oil refinery adjacent to this crushing plant.

1965–Cargill began crushing soybeans overseas at its new plant in Tarragona, Spain. The company opened a second crushing plant in 1968 in Amsterdam, the Netherlands. A third seed crushing plant [named Soja-France, with Dominique de Clerq as chairman of the board and general manager] was opened at St. Nazaire, France, in 1970. A crushing plant at Reus, Spain, also was added in 1970 and Australian cottonseed crushing operations were acquired in 1972.

1967–The company opened the Gainesville, Georgia, soybean processing plant. A refinery, Cargill's first to produce hydrogenated or "hardened" oil for the Southeastern food manufacturing industry, was built adjacent in 1979.

1970–Cargill built the Fayetteville, North Carolina, crushing plant and a refinery was added in 1976.

[1971–Soybean crushing plant at Fort Dodge, Iowa, sold to Land O'Lakes.]

1973–Soybean processing complex began operations at Ponta Grossa, Brazil.

1975–Acquired plant in Osceola, Arkansas.

1976–Soybean plant was built at Barcelona, Spain.

1977–Soybean plant constructed and operations began at Brest, France.

1978–The company opened a soybean processing plant in Sidney, Ohio, to serve domestic meal and oil markets. This facility was the company's first soybean processing plant designed to burn coal as its source of power.

1980–Construction began on vegetable oil refinery adjacent to Wichita soybean crushing plant and operations started in late 1981. A crushing plant also was acquired in Antwerp, Belgium.

1981–Company acquired a soybean crushing and vegetable oil refinery complex in Hartsville, South Carolina.

1982–Cargill acquired a soybean crushing plant in Monte Alto, Brazil.

Summary. Soybean Crushing: The company now operates soybean processing plants in the United States, the Netherlands, Belgium, France, Spain, Brazil. The plants range in capacity from 20,000 to nearly 120,000 bushels a day. In the U.S., the company operates 15 plants in Iowa, Illinois, Minnesota, Kansas, Virginia, North Carolina, South Carolina, Tennessee, Georgia, Arkansas and Ohio. It operates 6 U.S. refineries located in Gainesville, Georgia; Fayetteville, North Carolina; Des Moines, Iowa; Hartsville, South Carolina; Chicago, Illinois and Wichita, Kansas. Address: Public relations, Cargill, P.O. Box 5625, Minneapolis, Minnesota 55440.

943. **Product Name:** [Tofu Pizza].
Foreign Name: Tofu Pizza.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, D-8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.
New Product–Documentation: Letter from Peter Wiegand. 1982. June 22. Followed by phone talk. Talk with Peter Wiegand. 1987. Nov. 11. He introduced 7 tofu products on the day he started.

944. **Product Name:** [Tofu Apple Tart].
Foreign Name: Tofu Apfel-Kuchen, or Tofuschnitte.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, D-8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.

New Product–Documentation: Letter from Peter Wiegand. 1982. June 22. Followed by phone talk. Talk with Peter Wiegand. 1987. Nov. 11. He introduced 7 tofu products on the day he started. the day he started.

Talk with Michael Pierce (Graphic artist, Macon, Georgia). 1989. Oct. 30. He recalls this as being a tofu apple cake *(Apfelkuchen)*, made with apples.

945. **Product Name:** [Tofunafish Salad or Tofu Salad].
Foreign Name: Tofunafish Salad.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, D-8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.
Wt/Vol., Packaging, Price: Round plastic deli tubs.
How Stored: Refrigerated.
New Product–Documentation: Letter from Peter Wiegand. 1982. June 22. Followed by phone talk. Talk with Peter Wiegand. 1987. Nov. 11. He introduced 7 tofu products on the day he started.

Talk with Michael Pierce (Graphic artist, Macon, Georgia). 1989. Oct. 30. He recalls that the Tofunafish Salad was sold in round plastic deli tubs.

946. **Product Name:** [Tofu Mayonnaise].
Foreign Name: Tofu Mayonnaise.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, D-8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.
New Product–Documentation: Talk with Peter Wiegand. 1987. Nov. 11. He introduced 7 tofu products on the day he started.

Talk with Michael Pierce (Graphic artist, Macon, Georgia). 1989. Oct. 30. He thinks the mayonnaise was used on their burger, but not sold as an independent product.

947. **Product Name:** [Tofu Burger (Ready-to-Eat in Buns, or 3 Pieces in Vacuum Pack)].
Foreign Name: Tofu Burger.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, D-8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.
Wt/Vol., Packaging, Price: Vacuum packed.
New Product–Documentation: Talk with Peter Wiegand. 1987. Nov. 11. He introduced 7 tofu products on the day he started. The Tofu Burgers were the most successful of his products, followed by the Tofu Cakes. He was in business for two and a half years, closing in Oct. 1986. He was very evangelical during that time.

948. **Product Name:** [Auenland Tofu].
Foreign Name: Auenland Tofu.
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 4, 8210 Prien-Chiemsee, West Germany. Phone: 08054 579.
Date of Introduction: 1982. March.
Wt/Vol., Packaging, Price: Bulk.
How Stored: Refrigerated.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Owner: Peter Wiegand. Letter from Peter Wiegand. 1982. June 22. Followed by phone talk. Note: Apparently the company had not yet started. Peter got interested in tofu, in part, through Wildwood Natural Foods in Fairfax, California.

Form filled out by Peter Wiegand. 1982 (probably). Says that his company, Auenland Tofu, started making tofu on a commercial scale in April 1982. It is sold both vacuum packed and bulk in water.

Soyfoods Center Computerized Mailing List. 1982. Sept. 17. Owner: Peter Wiegand. Label. 1983, undated. 6.25 by 4.5 inches. Self adhesive. Many colored. Shows rayed sunrise over a rural village.

Letter from Wolfgang Furth-Kuby of Sojaquelle. 1984. April 26. "Lukas Kelterborn is not with us any more. The *Rundbrief* was mainly his thing. I knew it was not going to work this way, but I let him do it his way so he could learn. Lukas wanted to go into production of tofu so badly. He joined with Peter Wiegand and some other people and after having stuffed some 70,000 German marks into Peter's exhausted business, all went bankrupt."

Talk with Paul Duchesne. 1989. Aug. 26. Much of the following is the result of a conversation Duchesne had yesterday with Michael Pierce in Georgia (Phone: 912-752-8070 Office; 912-742-4234 Home). Wiegand sometimes used to refer informally to his company as "Wildwood II" because he felt such a strong connection with Wildwood in Fairfax, but neither the company nor the product was ever officially named Wildwood Tofu. It was always called Auenland Tofu, from the first day. Michael Pierce was present in Germany when the company started production (from Feb. to July 1982) in a small dairy barn, not in a garage. Michael did the artwork for the original labels. As soon as the products hit the market, the first plant was too small. Peter will now be very hard to get hold of. Try contacting his friend and benefactor, George Eich, Aumuehle 8210, Prien Chiemsee. George is a filmmaker who has money and may have invested in Auenland. Wiegand is presently on the outs with almost everyone–maybe including George. Wiegand also knew Wolfgang Furth-Kuby, whom he called "the Shurtleff of Germany."

Wiegand ran the small company for a while, then built a larger plant. In July 1983 Wiegand visited Fairfax for the 2nd or 3rd time. That fall, in October, Duchesne's son Paul went back to Germany with him at his new and larger facility. So the new operation, which Michael described as a huge dairy almost the size of a basketball court, contained 4 large pots for cooking, troughs, etc. and it never got completely used. Wiegand was very much in debt and working very hard. Everyone wanted the tofu but not the second generation products. So he sold his tofu mostly to food processors who made their own second generation products. He was not good at organizing, negotiating, scheduling, or managing his workers, who were not very productive. He was enthusiastic and a good salesman. After a while, he went crazy. His wife, who had a better head for business than Peter, did the bookkeeping.

For more history, see interview with Paul Duchesne, 25 Aug. 1989.

Talk with Michael Pierce (Graphic designer, 408 2nd St., Macon, Georgia 31201. Phone: 912-752-8083 Office). 1989. Oct. 30. Svadesha, who started making tofu before Wiegand, had a small operation in southeast Germany near the border, making only about 25-30 lb/week of tofu, sold at 10-11 health food stores in small lidded plastic tubs immersed in water. His tofu was in the stores when Auenland introduced theirs. Pierce went to Germany in Feb. 1982. The kitchen was getting put together when he arrived. He helped Wiegand develop a press and they started making tofu in late Feb. They also made soymilk *(sojamilch),* a baked tofu sandwich, tofu pizza, and tofu apple cake. He has an early German-language publication with recipes plus some labels. Auenland's early tofu was sold in bulk. Everyone was ready for it and people wanted more. In the early days, Auenland's people would go to the Rajneesh center and give classes on how to cook with tofu to 60-70 people. The day the company opened, it was too small. So Wiegand tried to expand, but that was a disaster, which also destroyed his family. He couldn't make enough money. Michael went to India in Feb. 1983 and when he came back in June 1983 Wiegand had a gymnasium sized building with 4 big kettles. He got the money from his ex-wife's father. Auenland got hooked up with a company near Salzburg that made mochi and seitan. (Note: It sounds like Sojvita Produktions & Norbert Brunthaler in Lichtenwörth, which was making seitan and mochi by mid-1984, but Sojvita was located southwest of Vienna, far away from Salzburg). That company had a store in Salzburg but produced foods in a home about 15 miles outside of the city. Auenland smuggled tofu to them in Austria and brought back excellent Austrian-grown soybeans. Later that Salzburg company started to make tofu. Auenland also bought organic soybeans from France, and used them to make tofu. Pierce got to know Wolfgang Furth-Kuby, whom he feels played a key role in getting tofu started in Germany, in part by translating *The Book of Tofu* into German. Pierce never heard Wiegand call the company Wildwood, only Auenland. Auenland is a folk name for that part of Germany (a mystical golden triangle in the mountains); its not a map term. The area was also called the Chiem-gau meaning "Bay Area." And it was also in a place called Wildenwald, which means "Wildwood." So there seemed to be many cosmic connections with Wildwood in California. It was located about 60 miles southeast of Munich on the Way to Salzburg.

Pierce also recalls hearing about a big research organization connected with a university in Stuttgart, both growing and utilization. They wanted to develop a soybean that grew in the area.

949. **Product Name:** [Baked Tofu Sandwich].
Manufacturer's Name: Auenland Tofu und Soja Produkte.
Manufacturer's Address: Hub 2, 8210 Prien-Chiemsee, West Germany.
Date of Introduction: 1982. March.
New Product–Documentation: Talk with Michael Pierce (Graphic artist, Macon, Georgia). 1989. Oct. 30. He recalls this as being different from the tofu burger, which was fried.

950. **Product Name:** Earth Angel Tempeh.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 03-544-8020.
Date of Introduction: 1982. March.
Ingredients: Organic soybeans, cider vinegar, tempeh starter (Rice, Rhizopus oligosporus culture).
Wt/Vol., Packaging, Price: 250 gm.
New Product–Documentation: Letter from Debbie Schmetzer. 1982. March 3. Earth Angel is just getting underway and their first product is tempeh. They soon hope to produce tofu and tofu puddings for the health food stores. Label. 1983, undated. 4 by 8 inches. Black on tan. 250 gm. Illustration of a a winged elf, with soybean leaves on both sides.

951. Saint Macary, H. 1982. Essais inoculation et survie du *Rhizobium japonicum:* Côte d'Ivoire, Tahiti, Congo [Inoculation and survival trials of *Rhizobium japonicum* in the Ivory Coast, Tahiti, and the Congo]. Montpellier, France: IRAT, Division d'Agronomie. 16 p. Plus 4 p. of appendixes. March. [Fre]
• ***Summary:*** This report is a continuation of the first report made in March 1981. Inoculation trials with soybeans (not inoculated, inoculated, and inoculated with nitrogen fertilizer) were conducted in the following places: Station at Man in the Ivory Coast. Station at Gagnoa. Station at Papara in Tahiti. Station at Loudima, Congo.

Generally the plate counts from the nodules were highest after 75 to 90 days with plain inoculation, but number of nodules, the dry weight of the nodules, and the dry weight of the plants was highest with inoculation + nitrogen fertilizer.

Trials were also conducted at Benin. The previous trial at Togo was not repeated. A trial at Réunion is underway. Address: Montpellier, France.

952. Shurtleff, William; Aoyagi, Akiko. 1982. Terrific tempeh. *Ziriuz (Australia).* March. p. 7-8.
• ***Summary:*** Contents: An introduction to tempeh. Rich in protein and vitamin B-12. Tempeh comes West. How tempeh is made. The miracle of fermentation. Buying and storing tempeh. Favorite tempeh recipes (four recipes). Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

953. *Times (London).* 1982. Commodities. April 14. p. 11, col. 1. Business section.
• ***Summary:*** The Falklands crisis is underway. "Traders in Rotterdam [Netherlands], however, said that post sunoil, linoil and soyaoil prices appeared to be rising in response to the EEC embargo on imports from Argentina, which is an important supplier of vegetable oils to the Community [EEC] at this time of year."

Note: This is the earliest English-language document seen that contains the word "soyaoil" (Sept. 2006) or the word "sunoil" (Oct. 2007) or "linoil" (Sept. 2006).

954. Auenland Tofu und Soja Produkte. 1982. Auenland Tofu und Soja Produkte [Auenland Tofu and soy products (Brochure)]. Prien-Chiemsee, West Germany. 4 p. 29 cm. [Ger]
• ***Summary:*** The colorful cover of this brochure was illustrated by Michael Pierce, an American friend of Peter Wiegand, who started the company. The cover is filled with an illustration of a rayed orangish-red sun setting behind a range of green mountains over a little German village with red-roofed houses and a church. In the foreground is green grass, then flowery knolls and a small river. The inside two pages are devoted to a nine-point explanation of "What is Tofu?" On the rear cover are six recipes, below which we read: "Further recipes are available in *Das Tofu-Buch* (Ahorn-Verlag [published July 1981])."

Talk with Michael Pierce of Georgia. 2000. Oct. 11. He confirms that he illustrated this cover in about April 2000. It appeared at about the same time as Auenland's first products. Peter Wiegand started the company using his wife's money; that's one reason he is no longer married to her. Address: Hub Bleimhaus, D-8210 Prien-Chiemsee, West Germany.

955. Shurtleff, William; Aoyagi, Akiko. 1982. History of whole dry soybeans. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 28 p. May 19. Unpublished typescript.
• ***Summary:*** A comprehensive history of the subject. Contents: Introduction: How to categorize. Etymology. Part I: History of whole dry soybeans in East Asia. General. China. Japan. Other East Asia. Part II: History of whole dry soybeans in Europe and Australia. Early developments (1793-1899). 1900-1939. 1940-1982. Part III: History of whole dry soybeans in the United States. Cultural background: Poor man's food with poor image. Early developments (1855-1899). 1900-1929: World War I commercial products, USDA work, Seventh-day Adventists. 1930-1959: World War II growth of interest and commercial products, recipes, drop of interest 1946-1959. 1960-1982. Part IV: History of whole dry soybeans in Third World countries. Address: Lafayette, California. Phone: 415-283-2991.

956. Wiegand, Peter. 1982. Re: Starting Auenland Tofu in Germany. Letter to William Shurtleff at Soyfoods Center, June 22. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** This letter is written on a colorful letterhead showing a rayed reddish-orange sun setting over a village. "I learned to make tofu in Fairfax, California, at Wildwood Natural Foods, working with Paul Duchesne for about 6 months. In the autumn of last year my family and I returned to Germany and opened a tofu kitchen in the spring of this year [March 1982]. At the beginning we named our kitchen the same as in California (Wildwood Natural Foods), but we soon decided to give it a German name. Tofu is getting a bigger market more and more. Our small kitchen is now able to produce about 200 kg/day of tofu. Since we started I have met a lot of people who are really interested in tofu and Sojaproducts, and they want information. We are right at the beginning and tofu needs a lot of promotion because it is unknown. The health department gives us a lot of trouble about using nigari, the shelf life, packaging, using another name than tofu, etc.

Follow-up phone talk: Since the beginning we have made tofu burgers, tofu salad, tofu pizza, and Tofu Apfelkuchen (Apple Tart, using tofu instead of quark). There was a big party when the company started. Address: Auenland Tofu & Sojaprodukte, Hub 4, D-8210 Prien/Chiemsee, West Germany.

957. Fernando, L.H.; Asghar, M.; Chase, R.G.; Fitzgerald, J.; McDonnell, M.R. 1982. Field experiments with cereals and grain legumes in W. Samoa. *Alafua Agricultural Bulletin (Apia, Western Samoa)* 7(2):40-46. April/June. [9 ref]
• ***Summary:*** In the section on "Grain legumes or pulses," the first plant discussed is the "Soya bean *(Glycine Max* L): This is the most important of the pulses, because of its oil and protein contents. However, in the islands of the South Pacific this is not yet regarded as a useful crop. Small extents of soya bean have however been grown. The varieties Bragg, PB-1 and Improved Pelican introduced from Sri Lanka in 1979 were grown very successfully in small plots at Alafua in 1981. In these varieties high yield was found to be dependent on the number of pods per plant (Singh 1980) and both seed number and seed size (Taufa 1981).

"The variety Davis from Hawaii was used at Nu'u in 1981 in legume inoculation experiments in association with the Project for Nitrogen Fixation by Tropical Agricultural Legumes (NifTAL). In all the efforts made so far from 1979, growth and pod production have been very impressive even with little or no fertilizer... In an experiment at Nu'u in 1981, sponsored by NifTAL, plots which were sown with inoculated seed yielded 3458 kg/ha of seed...

"Sixteen elite varieties of soya bean were received in 1982 from the Intsoy International Soybean Program conducted by the University of Illinois, and these are now ready for sowing in a replicated field experiment at Alafua.

"The critical factor in soya bean production is to bring the plants into maturity in the dry weather of June and July; sowing is therefore best done in April.

"If soya bean is grown for the unripe seed, for use as a vegetable, it does not need to be harvested in dry weather. The green pod is harvested and the immature seed is eaten [after boiling]... Soya milk is a substitute for cow's milk..." Address: 1,4-5. Dep. of Crop Production; 2-3. Dep. of Soils Science. All: School of Agriculture, Univ. of the South Pacific, Apia, Western Samoa.

958. **Product Name:** Ceres Natural Soy Milk.
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor). Made in Japan.
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1982. August.
Wt/Vol., Packaging, Price: 180 ml pouch.
How Stored: Shelf stable.
New Product–Documentation: Talk with Don Lazzaro of Ceres Natural Foods. 1995. June 6. Their first imported product was named Ceres Natural Soy Milk. The label was an "oversticker" on a narrow plastic (not foil) stand up pouch in those days. It was made by either Marusan or Saniku.

Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In Aug. 1982 they introduced a soymilk product in a 180 ml pouch with a Ceres label, made by and imported from Saniku Foods in Japan. In Oct. 1983 this pouch was redesigned and became available in four flavours [probably natural, vanilla, barley malt, and one other]. During the mid-1980s, Ceres also imported and sold the Westbrae Westsoy and Ah Soy brands from the USA.

959. Quick, Graeme R. 1982. Preface. In: Vegetable Oil Fuels: Proceedings of the International Conference on Plant and Vegetable Oil as Fuels. St. Joseph, Michigan: ASAE. xiii + 400 p. Held 2-4 Aug. 1982 at Fargo, North Dakota, Holiday Inn. Illust. 23 cm. *

960. **Product Name:** Blue Lotus Tofu.
Manufacturer's Name: Blue Lotus Foods.
Manufacturer's Address: P.O. Box 44, Gembrook, VIC 3783, Australia. Phone: 756-7374.
Date of Introduction: 1982. September.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1982. Sept. 17. Owner: Eng Eu or Beng Eu. Ad in The Macrobiotic Journal Origins. 1982. Autumn. p. 12. "Blue Lotus Tofu, The food of the future." It is made with nigari and hand-pressed in cedar boxes. Contact: Monbulk [in Melbourne, VIC].

Letter from Darren Fletcher of Darkville, Melbourne. 1984. Sept. 4. Another soyfoods business in Melbourne is Blue Lotus Tofu, Lot Vika Ave., Monbulk 3793. Phone: 756-7374. In Dec. 1986 Soyfoods Center received this address: Blue Lotus Tofu, Lot Vika Ave. Monbulk 3793, Melbourne, Australia. Phone: 756-7374.

Letter from Beng Eu. 1989. June 26. "Blue Lotus has been into natural organic soyfoods in Victoria, Australia, for 8 years now and is a controlled, small scale tofu manufacturer." Address is now P.O. Box 188, Gembrook 3783, Australia. Letter from Beng Eu. 1990. July 23. Address is now: Blue Lotus Foods ("Makers of fine soyfoods"), 3/83 Main Street, Gembrook 3783, Australia. Phone: (059) 681 307. Letter from Loan Eu. "We are manufacturers and distributors of soyfoods in Australia and we would like to include in our range of products all available tofu cookbooks." Fax number is now (059) 681866.

Letter (fax) from Beng Eu. 1994. July 18. Address is now: Blue Lotus Foods ("Makers of fine soyfoods"), 9/83 Canterbury Road, Kilsyth, VIC 3137, Australia. Fax: 61 3 728 6011. Beng and Joan Eu, Partners.

961. **Product Name:** Tofu.
Manufacturer's Name: Chung Hing Bean Curd Manufacturing.
Manufacturer's Address: 268 Victoria St., Melbourne, VIC, Australia. Phone: 033-284-596.
Date of Introduction: 1982. September.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1982. Sept. 17.

962. **Product Name:** Earth Angel Tofu Cheesecake.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 03-544-8020.
Date of Introduction: 1982. September.
New Product–Documentation: Letter from Debbie Schmetzer. 1982. March 3. "At the moment we are selling tempeh as well as tofu cheesecakes to a natural foods restaurant, and the response was great."

963. **Product Name:** Earth Angel Tofu.
Manufacturer's Name: Earth Angel Soyfoods.

Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 03-544-8020.
Date of Introduction: 1982. September.
New Product–Documentation: Letter from Debbie Schmetzer. 1982. March 3. Earth Angel is just getting underway and their first product is tempeh. They soon hope to produce tofu and tofu puddings for the health food stores. "Right now there are two Chinese factories that produce inorganic gypsum tofu and people would rather see organic tofu on the market... At the moment we are selling tempeh as well as tofu cheesecakes to a natural foods restaurant, and the response was great."

Letter from Darren Fletcher of Darkville, Melbourne. 1984. Sept. 4. "Earth Angel Soyfoods makes tofu and tempeh. They may close down in the near future. They told me that they would like to finish and take off for a laid-back country life style. Too much hard work they said. They will look for someone to buy the business."

964. Fernando, L.H. 1982. Continuous cropping in cereal-legume-root crop rotations. *Alafua Agricultural Bulletin (Apia, Western Samoa)* 7(3):96-98. July/Sept. [2 ref]
• ***Summary:*** Experiments in Western Samoa (Fernando, Asghar et al. 1982) have shown that pulses or grain legumes, including the Soya Bean, "are best grown to mature in the low rainfall months of June and July." Thus the soya bean should be planted in April.

The author then describes three crop rotations, none of which includes soya beans. Address: Senior Lecturer, Crop Production Dep., School of Agriculture, Univ. of the South Pacific, P.O. Box 890, Apia, Western Samoa.

965. **Product Name:** Tofu.
Manufacturer's Name: Hong Oriental Food.
Manufacturer's Address: 189 Lt. Bourke St., Melbourne, VIC, Australia. Phone: 036-632-811.
Date of Introduction: 1982. September.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1982. Sept. 17.

966. Hymowitz, T. 1982. Exploration for a wild relative of the soybean on Vanuatu. *Naika (Port Vila, Vanuatu)* 7(Sept.):1-4. *

967. **Product Name:** Tofu, Tofu Cakes, Tofu Sandwiches, and Soymilk.
Manufacturer's Name: Tofu Shop.
Manufacturer's Address: 78 Bridge Rd., Richmond, Melbourne, VIC, Australia. Phone: 03-429-6024 or 6204.
Date of Introduction: 1982. September.
New Product–Documentation: Form filled out by Malcolm Green. 1983. They also operate a deli serving soyburgers, sushi rolls, kanten (agar) sweets, tofu rice sandwiches, various soy drinks, and health foods. They use 10-15 lb/day of dry soybeans.

Soyfoods Center Computerized Mailing List. 1983. June 20. Owner: Malcolm Green.

Newspaper article by Jeni Port. 1983. "The tofu is here!" (Title of newspaper and exact date unknown). A photo shows Malcolm and Guna Green and their baby, Georgia, in their Richmond home, the first tofu shop in Melbourne. At "The Tofu Shop" (78 Bridge Road, Richmond) Malcolm and Guna make and sell a variety of soy foods, "specialising in tofu and tempting tofu cakes and sandwiches for the take away trade. It seems incongruous that the former butcher shop now contains Melbourne's first retail outlet for tofu, a food so strongly associated with vegetarianism." Making tofu is an art "that has taken Malcolm many years to master." They also sell soy milk for 90 cents a litre.

Letter from Darren Fletcher of Darkville, Melbourne. 1984. Sept. 4. "I've decided I don't want to commit myself to the tofu business. Too much long and hard work and I really think Melbourne has enough tofu shops. I also work with Malcolm Green's Tofu Shop."

968. Newell, C.A.; Hymowitz, T. 1982. Successful wide hybridization between the soybean and a wild perennial relative, *G. tomentella* Hayata. *Crop Science* 22(5):1062-65. Sept/Oct. [22 ref]
• ***Summary:*** "Hybrids between the soybean *[Glycine max* (L.) Merr.] and a wild perennial relative, *G. tomentella* Hayata, were obtained for the first time through in vitro ovule culture. The F-1 plants were vegetatively vigorous and resembled the wild male parent morphologically. The chromosome numbers were consistent with a hybrid origin. The plants flowered profusely but were sterile." The use of wild perennial *Glycine* species might become feasible for broadening the germplasm base of the soybean.

"The genus *Glycine* Willd. as currently delimited is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm." Within the subgenus *Glycine*, five species are found only in Australia: *G. canescens, G. clandestina, G. falcata, G. latifolia,* and *G. latrobeana. G. tabacina* is found in Australia, South China, Taiwan, the Ryukyu Islands, Mariana Islands, and other South Pacific Islands. *G. tomentella* is found in Australia, South China, Taiwan, Philippines, and Papua New Guinea.

Note: This is the earliest document seen (May 2001) describing wide hybridization and the successful transfer of genes from one species of *Glycine* to another, i.e., between the cultivated soybean *(Glycine max)* and its wild perennial relative. Address: Dep. of Agronomy, Univ. of Illinois, Urbana.

969. **Product Name:** Tofu.
Manufacturer's Name: SoySource Tofu Shop.

Manufacturer's Address: 79 Mandeville St., Riccarton, Christchurch, New Zealand.
Date of Introduction: 1982. October.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1981. Jan. 22. Owner: Jon Judson. Soyfoods Center Computerized Mailing List. 1981. Dec. 8. Address given as 917-B Colombo St., Christchurch, New Zealand. Letter from Alan Tam. 1986. Nov. 18. "On a recent visit to Christchurch, I found that the previous owner of this company had sold out; the address and names of the new owners are not known. They make about 500 lb/week of tofu."

Letter (fax) from Jan Batchelar of Tremanco / The Soy Works. 1993. Feb. 3. "Soysource was sold and the business changed its name to Pacific Foods. The address is 377 Selwyn Street, Christchurch, New Zealand. Phone: 643-365-5268."

Talk with Elizabeth Chalmers of The Organic Soy Co., Auckland, New Zealand. 2007. Jan. 15. She, Greg, and Rick Chambers taught Jon how to make tofu. He came to Auckland, worked in the factory, and stayed with Greg. Elizabeth thinks Jon started actually his own company after Oct. 1982.

970. Joyce, Michael. 1982. Re: Tempeh in Australia. Letter to William Shurtleff at Soyfoods Center, Nov. 17. 4 p. Handwritten.
• ***Summary:*** "Greetings from Australia. My wife, Julie Anne, and family had the pleasure of meeting your friends Cyril and Elly Cain earlier this year. They have shared so many wise, fruitful and wonderful experiences with us and they have set up Australia's first tempeh shop.

"In their sharing with us the knowledge of tempeh and the wide and varied range of the soya bean, we have begun to appreciate the work you and Akiko have done over the past decade.

"Could you please send details of the INTSOY program in India to Dr. Ernest Koomapalli, c/o Pastor V.A. Thampy, Changanacherry 2, Kerala, South India. These people are feeding 450 children and 50 adults and I know the knowledge of soya bean will be a blessing to them.

"We are helping Cyril and Elly with the tempeh shop and hope to continue making fine tempeh from what they have set up when they return to the U.S. in 1983. Cyril will leave all his books." Address: P.O. Box 45, Woonbye 4559, QLD, Australia.

971. Ceres Natural Foods. 1982. Ceres (Ad). *Macrobiotic Journal Origins (Armdale, Australia)* No. 1. Autumn. p. 1 (Inside front cover) and p. 6.
• ***Summary:*** "Our spacious store is filled with the biggest range of macrobiotic whole foods in Melbourne." A full-page ad states that the store notes that it carries "soysauce" and macrobiotic staples. Address: 116 Chapel St., Windsor, VIC, Australia. Phone: 529-2206.

972. **Product Name:** Real Foods Shoyu.
Manufacturer's Name: Real Foods Pty. Ltd. (Importer). Made in Japan.
Manufacturer's Address: P.O. Box 136, Edgecliff, NSW 2027, Australia.
Date of Introduction: 1982. November.
New Product–Documentation: Ad in The Macrobiotic Journal Origins. 1982. Autumn. p. 5 and 30. Inside rear cover. "Like a fine wine. Traditional methods produce traditional quality. Real Foods Shoyu (Tamari) is a naturally fermented soy sauce which has been aged in wood for two years." Real Foods is a distributor of traditional, macrobiotic foods with branches in St. Peters, NSW, and in Windson, VIC, Australia.

973. **Product Name:** Soymilk Yoghurt.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 544-8020.
Date of Introduction: 1982.
Ingredients: Soymilk made from organic soybeans, yogurt culture.
Wt/Vol., Packaging, Price: 500 gm.
How Stored: Refrigerated.
New Product–Documentation: Label. 1982. 4.25 by 3 inches. Paper. Blue on white. "Store below 5°." Reprinted in Soyfoods Marketing. Lafayette, CA: Soyfoods Center.

Australian Dairy Foods. 1986. Feb. p. 84. The product, now named Earth Angel Soyoghurt, is sold in a small plastic tub.

974. Muller, L.L. 1982. What the different branches of the food industry require from dairy ingredients. Dairy vs. non-dairy [soy] ingredients. Technological and functional aspects. *International Dairy Federation, Bulletin* No. 147. p. 89-94. Presented in Luxembourg, 21 May 1981. [26 ref]
• ***Summary:*** The advantages and disadvantages of soy protein instead of milk are considered. Based on seminar proceedings held in Luxembourg in May 1981. Address: Dairy Research Lab., CSIRO Div. of Food Research, P.O. Box 20, Highett, Victoria 3190, Australia.

975. Photographs of Peter and Elgard Wiegand establishing Auenland Tofu in Germany and making tofu there. 1982. Prien-Chiemsee, Germany.
• ***Summary:*** These twenty color photographs (each 3½ by 5 inches or 3 inches square) were taken at Prien-Chiemsee in southern Germany in 1982 by Michael Pierce, while he was visiting his friend Peter Wiegand. They show: (1-5) Farmhouses in the village near the tofu kitchen. (6) The tofu kitchen, which was an old dairy but looks like a small

village farmhouse. (7) Three containers of okara by the door of the tofu kitchen. (8-9) A person preparing the tofu kitchen building. (10) Portrait of Elgard. (11) Peter Wiegand sitting cross-legged by a wide waterfall. (12) Peter & Elgard hugging on the steps of a house. (13) Their children, Lila and Janna, pulling toys on a road. (14) "Another tofu freak in Germany" riding a very high bicycle, which he invented and built. (15) Michael trying to cheer up Peter (lying on the ground) after a long day in the tofu kitchen. (16-18) A cake of Auenland Tofu, vacuum packed, on a snowbank. The label shows a colorful rayed orangish-red sun setting over a little village behind a range of green mountains. (19) The village of Prien-Chiemsee with its tall spired church and snow-capped mountains in the background. (20) Three young people seated by the door of the tofu kitchen.

Update. Talk with Michael Pierce of Georgia. 2000. Oct. 11. Peter is now a singer with his own band. He sings many songs written and record by Tom Waits. Peter no longer does graphic art. Michael goes to Germany once or twice a year fora month or so to be with Peter and to help move his band from one gig to the next.

976. Viner, R.; Prasad, M.; Nath, R.; Kumar, H.; Prasad, R.; Singh, B.; Nand, S. (Mrs). 1982. Pulses and dry zone crops. *Fiji Dep. of Agriculture, Annual Research Report* For the year 1981. p. 32-34.

• ***Summary:*** The following pulses and dry zone crops were tested: Intercropping trial, soya bean (also spelled "soya beans"), urd, mung, pigeon pea, peanut, maize, sorghum, farming systems.

The subsection on soyabeans states: "Variety trials: Three Intsoy trials were laid out, one in Bua in April and 2 at Legalega in late March and late April [1981]. The trial in Bua suffered severely from drought and nutritional deficiencies." The best yields came from I GH 24 (2,100 kg/ha; sown April 25 in 30 cm rows) and Tunia (2,090 kg/ha; sown March 31 in 60 cm rows). Address: Fiji.

977. **Product Name:** Coconut Soymilk.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 544-8020.
Date of Introduction: 1982?
Ingredients: Soymilk made from organically grown soybeans, coconut milk, and honey.
How Stored: Refrigerated.
New Product–Documentation: Letter and Label sent by Debbie Schmetzer of Earth Angel Soyfoods. 1983. Feb. 19. "I am interested in improving our soymilk. At present we are making coconut soymilk sweetened with honey... Do you have any information on how the Japanese (Bonsoy) soymilk is made, using pearl barley and barley malt as sweeteners?"

Label. 8.5 by 2.5 inches. Paper. Dark blue on beige. Coconut trees with sun peeping out from between them. Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update.

978. **Product Name:** Soy Pate.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 544-8020.
Date of Introduction: 1982?
Ingredients: Okara, soymilk, brewer's yeast, tamari, oil, herbs and spices.
Wt/Vol., Packaging, Price: 250 gm.
How Stored: Refrigerated.
New Product–Documentation: Label. 3.5 inches diameter. Paper. Green on white. Illustration of winged pixie between two groups of leaves. "Great on sandwiches, toast, or appetizers. No additives or preservatives. No additives or preservatives. Keep refrigerated."

979. **Product Name:** Tempeh.
Manufacturer's Name: Michael Joyce Tempeh.
Manufacturer's Address: P.O. Box 45, Woonbye 4559, QLD, Australia.
Date of Introduction: 1983. February.
New Product–Documentation: Shurtleff & Aoyagi. 1983. Soyfoods Industry & Market. Michael and Julie Anne Joyce.

980. **Product Name:** Tofu.
Manufacturer's Name: Super Bean Foods. Renamed The Soy Works in Nov. 1986.
Manufacturer's Address: 205A High Street, Motueka, South Island, New Zealand. Phone: MPX 22252.
Date of Introduction: 1983. February.
How Stored: Refrigerated.
Nutrition: Per 100 gm.: Moisture 79%, fat 4.3%, protein 12%, ash 1.2%, energy (calories) 120, calcium 146 mg, sodium 6 mg, phosphorus 105 mg, iron 1.7 mg.
New Product–Documentation: Letter from and form filled out by Linda Carrington and Cindy Maisey. 1984. Oct. 11. "Our business (26 York St., Motueka) is very small; we work one day a week, which includes delivery. The local population is small and conservative but we are slowly getting regular customers. We hope to begin using the okara to make tempeh which isn't (as far as we know) being produced in New Zealand... We have a lot of problems getting a supply of good beans at a reasonable price... My partner, Cindy, and I are both dedicated to helping people eat a healthy, meatless diet. We have organised a promotion at a fair in mid-November and hope to win a few more converts. Our production methods are very labour intensive as we began with no capital but we have just received a grant of $1,000 and a loan of $2,000. This has made all the

difference to our operation and we feel inspired to continue despite hassles with packaging."

Letter and business card sent by Jan Batchelar, owner. 1989. Nov. 8. "I have a small tofu kitchen presently producing approximately 150 kilos, 2 days a week... I am vac-packaging the tofu, but the production side is very labour intensive, using large pots–a hand press... I am also looking to develop a vegetarian sausage from the okara."

Letter (fax) from Bruce Trevett and Jan Batchelar of The Soy Works. 1991. Aug. 5. "The Soy Works has been in operation since February 1983 producing tofu for the local market. Our most recent product is Vegetarian Sausages [okara and soy protein are the two main ingredients] which are selling extremely well." The phone/fax is now 64-03-528-9170. At the bottom of the letterhead is written "Manufacturers of tofu & vegetarian food."

Pre-cooked. Dairy free."

Label, leaflet, and letter sent by Bruce Trevett & Jan Batchelar. 1992. Jan. 23. 6 by 8 inches. Plastic bag. Green, white, and blue. "High protein. No cholesterol Low fat. Storage: Keep refrigerated. Rinse on opening. Immerse any excess in water and change water daily." Address on front of bag is: 205A High St., Motueka. Back of bag states: "For more information and recipes send SAE to The Soy Works, P.O. Box 158, Motueka."

The leaflet (8½ by 11½ inches, 6 panels) titled "The Soy Works Tofu, a Healthy Alternative" is blue on green. It discusses the benefits of tofu and gives 6 recipes.

The letter notes that the company, originally named "Super Bean Foods" [Superbean, on Tudor St., Motueka], was formed in Feb. 1983 in a partnership with Cindy Maisey and Linda Carrington. "In Nov. 1986 Cindy and Jan Batchelar formed a new partnership and changed the name to "The Soy Works." This partnership ran for two years, then Jan took over as sole trader until Nov. 1990, when she formed another partnership with Bruce Trevett, who brought with him his machinery manufacturing skills and business management abilities. With increased business skills and forward planning to expanding markets, plus the introduction of the Vegetarian Sausages in March 1991 (the first product of its type in New Zealand) The Soy Works has continued to prosper and grow. We are in the process of planning consent to build a new manufacturing facility that will enable us to expand our product base and increase our market share throughout New Zealand. We know of only three other tofu manufacturers in New Zealand: Bean Supreme in Auckland, Hing's Tofu (Sun Hing Foods Co.) in Wellington, and Pacific Foods in Christchurch."

Letter (fax) from Jan Batchelar of Tremanco / The Soy Works. 1993. Feb. 3. "Super Bean Foods started selling tofu on a commercial basis in Feb. 1983. Their address was the same then as it is now–205A High Street, Motueka." But on the fax, the only address given is Huffam Street, P.O. Box 158, Motueka.

981. Joyce, Michael; Joyce, Julie. 1983. Re: Growing soybeans in Australia. Tempeh and tofu down under. Letter to William Shurtleff at Soyfoods Center, March 5. 4 p. Handwritten.

• ***Summary:*** "In Queensland, Australia, soybean still are grown mainly inland, away from the coast. But in coastal regions the wet season occurs when the bean is mature (March-April).

"The beans are sown the first week in December. Inland the yield averages 1.25 tonnes (metric tons) per acre while on coastal regions, if weather permits, yields can be up to 2.25 tonnes per acre. The Department of Primary Industries is presently encouraging sugar cane farmers to intercrop soybeans as a nitrogen fixer, while contracting at $217.00 per tonne this year to the United Grasiers Association.

"Most of the production is high oil content, small beans. I believe we have a similar climate to Florida and I would be interested in high protein soybeans grown in that region for tempeh and soyfoods production. Names of varieties would be a big help. The varieties grown for oil here are Wills, Leslie, and G522 and their heritage can be traced to the Florida region.

"Most soybeans are now grown by a method called "No tillage direct drill," which is by no means organic. It requires aerial spraying with Round-Up, a systemic herbicide, then direct drilling sowing (same as planting sugar cane) one week later.

"We are fortunate to have an organic farmer, supplier, of three generations, farming 200 acres for the culinary trade. He grades and cleans and supplies to us only his biggest beans which we find suitable for tempeh and tofu.

"Cyril and Elly Cain have indeed pioneered tempeh in Australia. They have now set up a small, low-tech shop in Maroochydore, Queensland, and are proud parents of a 7 week old beautiful girl named Jessimin. They are soon to return to the U.S. and Julie and I will be taking over the tempeh shop and moving production to our farm at Cooloolabin, which is west of Yandina and Eumundi at 1,000 feet. We feel it will be more suitable for tempeh in the mountains where we will be more subject to a tropical climate than on the coastal regions only 10 miles away.

"We hope to develop these small beginnings into a "pilot plant" which may spread knowledge of soyfoods to both residents and non-residents of Australia. As our vision unfolds we shall keep you informed of all aspects of progress and the greater good prevailing in this important work. Cyril and Elly will always be remembered as the producers of Australia's first and finest commercial soy tempeh. Their tempeh is known throughout the East Coast to be unsurpassed for flavour and shelf life. Always sold fresh, not frozen. Delicious. We wait in hope and peace. Giving glory to God." Address: Queensland, Australia.

982. Wiegand, Peter. 1983. Re: Moving Auenland Tofu to a larger plant. Letter to William Shurtleff at Soyfoods Center, March 28. 1 p. Typed, with signature on letterhead. [Eng]
• ***Summary:*** "Right now I want to put all my energy into the new place I have found for the tofu plant. A lot of money is going into it and I can't make any mistakes." Address: Auenland Tofu & Sojaprodukte: Residence: Schlossstr. 11, D-8201 Wildenwart-Frasdorf, West Germany. Phone: 08051/2799.

983. **Product Name:** Tofu.
Manufacturer's Name: Chinese Farmhouse Tofu.
Manufacturer's Address: Motts Rd., Main Arm, Mullumbimby, NSW 2482, Australia.
Date of Introduction: 1983. June.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1983. June 20. Owner: Ian Mott and Yuen Har Louie. Phone: Not listed.

Letter from Gregory Nance-Kivell, consultant. 1991. Oct. 8. Chinese Farmhouse Tofu is now a Division of Challenge Foundation of NSW–Tweed Branch (at Tweed Heads). The accounts and administration are located at: P.O. Box 654, Murwillumbah 2484, Australia. Phone: (066) 72 2834.

Letter from Greg Nance-Kivell, consultant. 1993. Aug. 12. The company letterhead and business card now reads: "EarthStar–Manufacturers of Quality Wholefoods, P.O. Box 654,..." They have ordered 2 copies of Tofu & Soymilk Production, and note: "We are a non-profit organisation with the aim of giving work opportunities to people with disabilities. We produce organic products based on soybeans, chickpeas, wheat, etc. We produce under three brands and products include tofu, soymilk, hommus [hummus], felafel, vegi sausages, and we will market soy yoghurt desserts in the future. We took over Chinese Farmhouse some 3 years ago."

984. **Product Name:** Tofu.
Manufacturer's Name: Jon Weekes Tofu.
Manufacturer's Address: 6/405 Alma Rd., Caulfield, Melbourne, VIC, Australia.
Date of Introduction: 1983. June.
New Product–Documentation: Soyfoods Center Computerized Mailing List. 1983. June 20. Owner: Jon Weekes.

985. Hymowitz, Theodore. 1983. Germplasm collection, management, and evaluation: The subgenus *Glycine*. *INTSOY Series* No. 25. p. 69-70. B.J. Irwin, J.B. Sinclair, and Wang Jin-ling, eds. Soybean Research in China and the United States (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** "The genus *Glycine* Willd. is composed of two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The soybean, *G. max* (L.) Merr., and its wild progenitor *G. soja* Sieb. and Zucc., together make up the subgenus *Soja*. Both species are annual and diploid with 2n=40, and hybridization between them can be readily effected. Together they form the primary gene pool of the cultivated soybean.

"The subgenus *Glycine* comprises seven wild perennial species: *Glycine canescens* F.J. Herm., *G. clandestina* Wendl., *G. falcata* Benth., *G. latifolia* (Benth.) Newell and Hymowitz, and *G. latrobeana* (Meissn.) Benth. are diploids (2n=40) native to Australia; *G. tabacina* (Labill) Benth. is predominantly tetraploid (2n=80) with occasional diploids, and distributed in Australia, Taiwan, and the Ryukyu Islands [Japan], as well as several countries in the South Pacific; and *G. tomentella* Hayata represented by tetraploid (2n=80) forms in China (Taiwan), the south coast of China and northern Philippines, and diploid, tetraploid, and aneuploid (2n=38, 40, 78, 80) forms in Australia. From a taxonomic standpoint the members of the subgenus *Glycine* also are candidates for gene exchange with the soybean, and therefore potentially useful for broadening the germplasm base of the crop.

"Preliminary investigations have shown that the perennial species carry resistance to diseases such as soybean rust, yellow mosaic virus, and powdery mildew. Physiological traits exhibited by perennial material such as drought tolerance, salt tolerance, and day neutrality also may be of potential use." Address: Prof. of Plant Genetics, Univ. of Illinois at Urbana-Champaign.

986. Jackobs, Joseph A.; Staggs, M.D.; Erickson, D.R. 1983. International soybean variety experiment: Seventh report of results, 1979. *INTSOY Series* No. 24. viii + 211 p. July. (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** In the ISVEX trials, soybeans were tested in the following countries: Afghanistan, Algeria, Argentina, Bangladesh, Bolivia, Burma, Chile, China (Taiwan, ROC), Colombia, Cuba, Czechoslovakia, Ecuador, Egypt, Ethiopia, Fiji, French Guiana, Gambia, Ghana, Guatemala, Guinea, Iraq, Korea, Malawi, Malaysia, Mexico, Morocco, Nepal, Pakistan, Paraguay, Peru, Philippines, Portugal, Puerto Rico, Rwanda, Somalia, Sri Lanka, Sudan, Syria, Tahiti, Thailand, Turkey, United States, Zaire, Zambia, Zimbabwe.

Note: This document contains the 2nd earliest clear date seen for soybeans in Guinea, and the cultivation of soybeans in Guinea (1979, probably in May). Sixteen varieties were tested at Foulaya. CH-3 gave the highest yield, 2,690 kg/ha. The source of these soybeans was INTSOY (at the University of Illinois, USA) for ISVEX trials. Address: College of Agriculture, Univ. of Illinois, Urbana-Champaign.

987. IBPGR. 1983. Genetic resources of soyabean. Rome, Italy: International Board for Plant Genetic Resources, Secretariat. 19 p. 30 x 21 cm. Oct. IBPGR Working Group on the Genetic Resources of Glycine Species, held at the International Soybean Program (INTSOY) at the University of Illinois, Urbana, 9-11 Aug. 1982. [2 ref]
• ***Summary:*** This report, distributed free to developing countries but with restricted distribution to developed countries, was written after an ad hoc Working Group on the Genetic Resources of *Glycine* was held. A minimum list of descriptors is included. Address: Crop Genetic Resources Centre, Plant Production & Protection Div., FAO, Via delle Terme di Caracalla, 00100, Italy.

988. Jackson, Vicki. 1983. Squirrels vegetarian cook book. William Brooks Queensland, 921 Kingsford Smith Drive, Eagle Farm, Brisbane 4007, Queensland, Australia. 143 p. Illust. by Vicki Jackson. Index. Nov. 29 cm. 2nd ed. 1984.
• ***Summary:*** This hand-lettered cookbook was written for Squirrels Vegetarian Restaurant, Corner Melbourne & Edmonstone Streets, South Brisbane. The owners, Bronwyn Moses and Diana Mitchell, plan to open Squirrels on the Park, a second restaurant at 685 South Dowling St., Moore Park, Sydney, by Sept. 1984.

Soy-related recipes include: Chinese tofu soup (p. 12). Broccoli-pasta salad (with Soyaroni pasta, p. 30). Soyaroni marinaria [marinara?] (p. 52). Saucy soy stew (with cooked soybeans, p. 67). Tofu & peppercorn strudel (p. 79). About tofu (p. 86). Tofu satays with peanut sauce (p. 87). Battered tofu in sweet & sour sauce (p. 88). Tofu & peanut sauce (p. 89). Tofu & veggie curry (p. 90). Tofu & mushroom on spinach pasta (p. 91). Tofu & spinach loaf (p. 92). Tofu Chinese style (p. 93).

About tempeh, by Julie & Michael Joyce (p. 94; "Little did we know in early 1982, when we first ate tempeh made by Cyril & Ellie Cain of Eumundi, Sunshine Coast, that we were soon to become tempeh makers." They supply Squirrels with the tempeh they make). Tempeh chips (p. 96). Tempeh & tomato bake (p. 97). Tempeh sweet & sour (p. 98). Tempeh Indonesian style (p. 99). Tempeh Chinese style (p. 100). Tofu dessert (p. 125). Pages 141-42 describe tamari, tempeh, tofu, and miso. Address: Brisbane, Queensland, Australia.

989. Shurtleff, William; Aoyagi, Akiko. 1983. History of soy flour, grits, flakes, and cereal-soy blends. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 128 p. Dec. 24. Unpublished typescript.
• ***Summary:*** A comprehensive history of the subject. Contents: Part I: What are soy flour, grits, flakes, and cereal-soy blends? Introduction: Developed in the West, difference from roasted soy flour. Soy flour. Soy grits and flakes. Cereal-soy blends = soy-fortified blended foods. Etymology and nomenclature: German, French, U.S. English, U.S. whole soy flour, British English. Overview of world soy flour history. Part II: History of soy flour, grits, and cereal-soy blends in Europe and Australia. The early years (1767 to 1899). 1900 to 1919. Between two wars (1920-1939). 1940-1959. 1960 to 1983. Part III: History of soy flour, grits, flakes, and cereal-soy blends in the USA. The early years (1767-1919). 1920 to 1939. The 1940's and World War II. 1960 to 1980's. Food for Peace Program. Low cost extrusion cookers. Soy flour, grits, and flakes in America. Part IV: History of soy flour, grits, and cereal-soy blends in Canada. Part V: History of soy flour, grits and cereal-soy blends in Asia. Introduction. Bangladesh. China. India. Indonesia. Japan. Korea. Philippines. Sri Lanka. Taiwan. Thailand. Vietnam. Part VI: History of soy flour, grits, and cereal-soy blends in Latin America. Introduction. Bolivia. Brazil. Chile. Colombia. Costa Rica. Ecuador. Guatemala. Guyana. Mexico. Paraguay. Peru. Venezuela. Part VII: History of soy flour, grits, and cereal-soy blends in Africa. Introduction. Ethiopia. Ghana. Kenya. Nigeria. Rwanda and Burundi. South Africa. Tanzania. Uganda. Zimbabwe. Part VIII: History of soy flour, grits and cereal-soy blends in the Middle East.

Note: This is the earliest English-language document seen (July 2003) with the term "cereal-soy blends" in the title. Address: Lafayette, California. Phone: 415-283-2991.

990. **Product Name:** Pureharvest Organic Soy Drink [Natural, or Vanilla].
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor). Made in Japan.
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1983. December.
Wt/Vol., Packaging, Price: 200 ml Tetra Brik.
How Stored: Refrigerate after opening.
New Product–Documentation: Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In Dec. 1983 they introduced soymilk in vanilla and natural flavors, in 200 ml Tetra Brik cartons, made by and imported from Kibun in Japan.

991. **Product Name:** Golden Life.
Manufacturer's Name: Martin Pharmaceuticals. Div. of the Nicholas Kiwi Co.
Manufacturer's Address: Australia.
Date of Introduction: 1983. December.
Wt/Vol., Packaging, Price: Tetra Brik Aseptic cartons.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Geoff Wilson. 1987. Jan. Soyfoods (ESFA). Jan. The dates in this article are not clear. The product is said to be "the first Australian soy drink, launched late last year. A sport drink, it contains dextrose and is being packed in tetrabrik cartons in the Leongatha factory of Murray Goulburn Cooperative, Australia's largest

farm-owned dairy company. However other soy-based foods are not yet expected to be produced by other dairy companies, because of the anger the new soymilk technology's threat has caused among hard-pressed dairy farmers... The product is currently being sold through health food stores But other manufacturers are tipping that a range of soy based dairy food substitutes will become available to supermarkets in 1985. One health food shop in Melbourne has reported a tenfold sale of soy drinks over the last 6 months. They are made from isolated soy protein."

992. **Product Name:** Wonder-Vite Soymilk Drinks [Plain, or Carob-Honey].
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1983.
New Product–Documentation: Manufacturer's catalog. 1983, undated. Letter from C.H. Lee of Blissquik Food Products. 1992. Feb. 17. The only soy product his company is now making is soymilk (plain and flavoured). They started in 1983, not 1981. He is interested in making soy ice cream and soy yogurt in the near future. His company also makes Wonder-Vite Biodynamic Loaf (which contains "soyflour" as the second ingredient), Super Sprouts, Super Alfalfa Sprouts, and Mixed Vegies.

993. Chase, L.D.C.; Widdowson, J.P. 1983. Sulfur in the agriculture of the Pacific High Islands. In: Graeme J. Blair and A.R. Till, eds. 1983. Sulfur in South East Asian and South Pacific Agriculture. Armidale, New South Wales: Australian Development Assistance Bureau (ADAB). 336 p. See p. 206-17. 25 cm. [25 ref]*
• ***Summary:*** In the Solomon Islands, coastal sands and alluvial grassland soils on the North Guadalcanal Plains have been shown to be deficient in sulfur for grass and pasture legume species, soybeans, cocoa, coconuts, and oil palm. The deficiency is attributed to the loss of sulfur from regular burning of the grasslands, and to a low capacity to retain sulfate against leaching as a result of either sandy textures of the predominance of 2:1 clays.

Based on a Research for Development Seminar held 23-27 May 1983 at Ciawi, Indonesia. Address: Ministry of Home Affairs and National Development, Honiara, Solomon Islands.

994. **Product Name:** Earth Angel Okara-Rice Tempeh.
Manufacturer's Name: Earth Angel Soyfoods.
Manufacturer's Address: 53 Stanley Ave., Mt. Waverley (E. Oakleigh), VIC 3149, Australia. Phone: 544-8020.
Date of Introduction: 1983.
Ingredients: Okara (soybean pulp), brown rice, cider vinegar, tempeh starter (Rhizopus oligosporus).
Wt/Vol., Packaging, Price: 250 gm.
New Product–Documentation: Label. 1983, undated. 3.5 by 7 inches. Black on tan. 250 gm. Illustration of two elves under soybean leaves.

995. **Product Name:** [Hensel Tofu].
Foreign Name: Hensel Tofu.
Manufacturer's Name: Henselwerk GmbH (Marketer). First made by Auenland Tofu, then by Soyastern, then by KMK (Kurhessische Molkerei Kassel) in Kassel, West Germany.
Manufacturer's Address: Muehlenstrasse 5-7, Postfach 1120, D-7037 Magstadt, West Germany. Phone: 0719-4906.
Date of Introduction: 1983.
New Product–Documentation: Interview with Bernd Drosihn of Soyastern. 1987. Nov. 30. KMK (formally Kurhessische Molkerei Zentrale eG, Falderbaumstr. 23, D-3500 Kassel) is a dairy cooperative which produces tofu for Hensel. Hensel does not produce any tofu itself. KMK makes about 2,500 kg/week of tofu for them. Letter from Harry Whitford of Soyastern. 1987. Dec. 14. Henselwerk GmbH, Muehlstrasse 5-7, Postfach 1120, D-7037 Magstadt, West Germany, makes an estimated 2,000 to 2,500 kg/week of non-organic calcium sulfate or calcium chloride tofu. Hensel is a brand of Schoenberger Pflanzensäfte GmbH. They started to sell tofu in 1983. First they bought it from Auenland, then from Soyastern. Nowadays a dairy cooperative in Kassel (KMK) makes it for them.

Die Geschäftsidee. 1989. Dec. p. 33. This company in Magstadt, well known as a large supplier of dietetic foods, now makes tofu. Formerly, the enterprise dealt with other soy products. Because of its financial strength, its investment in fully automatic production equipment, and its large scale production, it is able to produce tofu at a low price.

Listed on the back of the package for Hensel Soja-Kost Soja-Schrot: Other products from the Hensel Soja-Kost Program. "Tofu comes in neutral tasting or marinated forms. It is made purely from plants and is a cholesterol free alternative to flesh or milk protein." Ad (2 by 5.25 inches, full color) in Kurier/Neuform. 1989. Dec. p. 21. "For Hensel Tofu and Tofu Rolls. The tofu is free of cholesterol and rich in protein. A color photo shows the tofu package and sliced tofu on a plate with onions and parsley.

Talk with Thomas Karas of Soyastern. 1990. March 14. Hensel's tofu is made by a dairy company named KMK (Kurhessische Molkerei Kassel) in Kassel.

Hensel leaflet. Sent 1990. March 30. 8 panels.

996. **Product Name:** Soy Flour, Soy Protein Concentrates, Soy Protein Isolates.
Manufacturer's Name: Meggitt Ltd.

Manufacturer's Address: P.O. Box 199, Parramatta 2150 NSW, Australia.
Date of Introduction: 1983.
New Product–Documentation: Soya Bluebook. 1983. p. 65.

997. **Product Name:** Sanitarium Health Foods Swiss Rounds (Vegetarian).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1983.
Ingredients: Textured vegetable protein, vegetable oil, rolled oats, onion, whey protein concentrate, thickeners, flavours, yeast extract, salt, sugars, herbs and spices, water added.
Wt/Vol., Packaging, Price: 430 gm can.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1983.

998. *Fiji Ministry of Agriculture & Fisheries, Annual Report.*1983. Research Division: Crops. For the year 1981. p. 40, 42-43. Parliament of Fiji. Parliamentary Paper No. 26 of 1983.
• ***Summary:*** In the section on "Crops," the subsection titled "4. Dry zone crops" (p. 43) discusses various crops and contains a short paragraph on soy beans: "Soya beans sown at the end of March and April indicated that similar yields can be achieved provided row spacing is reduced to increase plant density. This is despite a shortening of growth period and reduced available moisture." Address: Fiji.

999. Shepard, Merle; Lawn, R.J.; Schneider, M.A. 1983. Insects on grain legumes in northern Australia: A survey of potential pests and their enemies. St. Lucia, Australia: Queensland Press. 89 p. *
Address: Australia.

1000. Shurtleff, William; Aoyagi, Akiko. 1983. Leaders of the Soyfoods Movement in Europe (Document part). In: Shurtleff and Aoyagi. 1983. Soyfoods Industry and Market: Directory and Databook. 3rd ed. Lafayette, CA: Soyfoods Center. 121 p. See p. 109.
• ***Summary:*** The name, address, and phone number of the following people are given: Wolfgang Furth-Kuby of Sojaquelle, Peter Wiegand of Auenland Tofu, and Boo Massobrio of Weg Der Natur in West Germany. Verena Krieger and Walter Daenzer of Soyana in Switzerland. Sjon Welters of Manna Natural Foods in the Netherlands. Ted Nordquist and Tim Ohlund of Aros Sojaprodukter in Sweden. Bernard Storup of Soy SARL and Alexander Nahben of Europa Farm in France. Gilberto Bianchini of Community Food in Italy. Kym Olsen in England. Pierre Gevaert of Lima Foods in Belgium. Jane O'Brien in Ireland. Dr. Brian J.B. Wood of the University of Strathclyde, Microbiology Department, in Scotland. Lawrence Dreyer of Weg Der Natur in Austria. As of July 1982 there are 609 European names and addresses on the Soyfoods Center Mailing List. Address: Lafayette, California. Phone: 415-283-2991.

1001. Swaminathan, M.S. 1983. Relevance of protein improvement in plant breeding. In: W. Gottschalk and P. Hermann, eds. 1983. Seed Proteins: Biochemistry, Genetics, Nutritive Value. The Hague, Boston, and London: Martinus Nijhoff / Dr. W. Junk. viii + 531 p. See p. 1-23. [31 ref]
• ***Summary:*** Contents: Introduction. Factors limiting food output prospects. Nutrition study. Energy implications. Meeting the challenges. Emerging farming systems in the tropics and sub-tropics. Conclusion.

The number of people going to bed hungry in 1981 is greater than in 1974 when the World Food Conference in Rome unanimously resolved that all governments should strive to ensure that by 1984 "no child, woman, or man goes to be hungry, and that no human being's physical or mental potential is stunted by malnutrition."

Fig. 1 shows annual production of the world's major food crops (1980, FAO Production Year Book). The soybean is 8th (83 million tonnes), after wheat (445 million tonnes), rice (400), maize (392), potato (226), barley (162), cassava (122), and sweet potato (107). Fig. 2 shows the world's increasing dependence on grain exports from North America, Australia, and New Zealand; all other regions are net importers of grain.

Table 2 shows world use of grains for human consumption and livestock feeding from 1966 to 1980. In 1966 the ratio of the two was 1.32, whereas in 1980 it was 1.17. Thus in 1980 some 642 million tonnes of grains were used for human food and 548 million tonnes were fed to livestock.

Table 3 shows the percentage of available domestic grain used for livestock feeding in various types of countries from 1966 to 1980. In the developed countries it rose from 67.2% in 1966 to a peak of 70.7% in 1972 and 1973, then fell to 67.1% in 1980. In Eastern Europe and the USSR it rose from 42.5% in 1966 to a peak of 59.7% in 1979. In all developing countries it rose from 15.5% in 1966 to a peak of 20.3% in 1980. In all low-income developing countries it rose from 3.2% in 1966 to a peak of 3.8% in 1980. Address: International Rice Research Inst., Los Baños, Laguna, The Philippines.

1002. *USDA Plant Inventory.*1983. Plant material introduced January 1 to June 30, 1980 (Nos. 436991 to 443013). No. 188, Part I. 529 p.

• ***Summary:*** Soybean introductions: *Glycine max* (L.) Merrill. Fabaceae.

"Donated by Dr. N.I. Korsakov, Division of Grain Legume Crops, N.I. Vavilov Institute of Plant Industry, Leningrad, Soviet Union." All these varieties are designated "VIR" (Vavilov Inst.).

437069-437085. Amur Region and Far East

437124-437128. Gurijscaja and Imeretinscaja, Georgian SSR.

437129A-B. Irkutsk Region (Oblast) of Russia.

437130-437134. Gibrid ASS, Kazakh SSR.

437135-437148. Khabarovsk Province, USSR [on right bank of Amur River]

47149-437171. Krasnodar Province, USSR.

437172-437175. Kuybyshev Region, USSR.

437176-437178. Latvian SSR.

437179-437188. Lithuanian SSR.

437189-437303. Bel'tscaja, Bessarabea, Biruintsa, Brynzenscaja, Corichevava, CSchi, Dobruzanca, Errj, Moldavscaja, Rajner, Scorospelca, Staroucrainea, Vengerca nizcaja, Vysocoroslaja, Moldavian SSR.

437304. Moscow Region. 437305-437312. North Osetian [Ossetian] ASSR (An autonomous republic in the southeastern Russian SFSR on the north slopes of the Central Caucasus Mountains, bounded on the north by Stavropol Kray; Renamed Alania in 1991; capital Vladikavkaz).

437313-437315. Novosibirsk Region, USSR.

437316-437520. Primorsky Province, USSR [Maritime Province in Russian Far East, bordering on Sea of Japan, China and North Korea. Administrative center and soybean port: Vladivostok].

437521. Stavropol Province, USSR.

437522. Tshuvashskaja ASSR.

437523-437524. Turkmen SSR.

437525-437549. Ukranian SSR.

437550. Uzbek SSR (later Uzbekistan).

437551-437552. Voranezh Region, USSR.

437553-437813. Peoples Republic of China.

437814-438273. China, Northeast [formerly Manchuria] incl. Charbin [Harbin], Elita, Manczurscaja.

438274-438295. Japan (many named varieties).

438296-438309. South Korea (Republic of Korea).

438310-438312. North Korea.

438312-438341. Algeria.

438342. Argentina.

438343-438513. Australia, Bulgaria, Canada, Czechoslovakia, France, West Germany, East Germany, Hungary, India, Indonesia, Israel, Italy, Morocco, Nepal, Netherlands, Poland, Portugal, Romania, Sweden (13 Fiskeby varieties), United States (26 named varieties), Yugoslavia.

440913. Wild soybean from China. "Donated by Kirin Academy of Agricultural Sciences, Kungchuling, Kirin Province. Received through W.O. Scott, Dep. of Agronomy, Univ. of Illinois, Urbana. Received March 1980. Collected 1979.

440927-440943. *Glycine canescens* F.J. Herman. From Australia. "Donated (but not collected) by T. Hymowitz, Dep. of Agronomy, Univ. of Illinois, Urbana. Received Aug. 1979.

440944-440974. *Glycine clandestina* Wendl. From Australia. Donated by T. Hymowitz.

440975. *Glycine falcata* Benth. From Australia. Donated by T. Hymowitz.

440976-440977. *Glycine latrobeana* (Meissn.) Benth. From Australia. Donated by T. Hymowitz.

440978-440980. *Glycine latifolia* (Benth.) Newell & Hymowitz. From Australia. Donated by T. Hymowitz.

440981. *Glycine tabacina* (Labill.) Benth. From Fiji. Donated by T. Hymowitz. Collected 1930. Sigatoka, Viti Levu, Fiji. Collected by Greenwood. Wild.

440982-440997. *Glycine tabacina* (Labill.) Benth. From Australia. Donated by T. Hymowitz.

440998-441011. *Glycine tomentella* Hayata. From Australia. Donated by T. Hymowitz.

441012-441013. *Glycine tomentella* Hayata. From China. Donated by T. Hymowitz.

441339-441383. *Glycine max* (L.) Merr. Soybean. From Indonesia (East Java, Central Java, West Nuca Tanggara [West Nusa Tenggara, incl. Lombok and Sumbawa islands, in eastern Indonesia]). Donated by S. Djojoderdjo and Soebekti, Univ. of Gadjah Mada, Jogjakarta [Yogyakarta].

442003-442004. From China, Peoples Republic of. Donated by Institute of Crop Breeding and Cultivation, Chinese Academy of Agricultural Science, Beijing. Received through G. Liang, Dep. of Agronomy, Kansas State Univ., March 1980.

442005-442021. From South Korea. "Donated by Applied Genetics Laboratory, Korea Atomic Energy Research Inst., Seoul Received through R. Loiselle, Plant Gene Resources of Canada, Ottawa.

442022-442045. *Glycine max* (L.) Merr. Soybean. From Poland. "Donated by Plant Breeding and Acclimatization Inst., Radzikow / Warszawy. Some also from the Soviet Union and Yugoslavia.

442834. *Glycine max* (L.) Merr. Soybean. From China, Peoples Republic of. "Donated by T.C. Tso, Tobacco Laboratory, USDA, Beltsville, Maryland." Collected from a market near Quilin, Kwansi Province.

Note: In Part II: 445842-445849. From. Thomas A. Lumpkin, Zhejiang Academy of Agricultural Sciences, Hangzhoe, Zhejiang, China. Address: Washington, DC.

1003. **Product Name:** Soysage [Regular Dark, and Light Pineapple Smoked].
Manufacturer's Name: Soycraft.

Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. January.
Ingredients: Cracked soybeans, wholewheat, wheatgerm, herbs, spices.
Wt/Vol., Packaging, Price: 375 gm.
New Product–Documentation: Letter and Label sent by Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. "The two casing samples I'm enclosing show the two types of soysage we make: the dark color is regular, the sexy lighter color is for our Pineapple Smoked. You will never know the month or so of agony we went through to learn about the sausage business, the right casings, the right clippers, the right filler, the nights of torture as casing after casing burst at the high temperatures. The sausage people thought we were insane as few of them cook at the temperatures for the length of time we do, and our mix is so different from anything in the meat industry, although due to the high cost of meat many of the salami manufacturers are mixing in soy concentrate and persuading the public they are buying meat!"

1004. **Product Name:** Tofu Missing Egg Salad.
Manufacturer's Name: Soycraft.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. January.
Ingredients: Tofu, fresh vegetables, herbs and spices, shoyu, vegetable oil, mustard, apple cider vinegar, honey, sea salt.
Wt/Vol., Packaging, Price: 200 gm.
New Product–Documentation: Letter and Label sent by Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. The letter is on Klinica letterhead. "We have been so busy that nobody has yet staggered to the printer to collect Soycraft letterheads. I think Volli and her small crew sometimes wish it had never happened...

"We make tofu, and then use all of our tofu to make secondary products. At the present time we don't think there is market support for tofu, which would justify another firm in that line of business; it will be a year or two before Australians may wean away from their meat based diets. The local Chinese community makes and uses a lot of tofu, but it is really only the health food shops (about 230 in Sydney) that sell tofu. About 30% of these health food shops are still vitamin supply people and unaware of what it is all about anyway. Our tofu is made via the cauldron method–laborious, tedious, etc. We will consider buying the Takai W30A system towards the end of this year."

Label. 2.5 by 3 inches. Green on white. "All natural ingredients–No preservatives."

1005. **Product Name:** Tofu Paté.
Manufacturer's Name: Soycraft.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. January.
Ingredients: Tofu, soybean concentrate, sesame seeds, herbs & spices.
Wt/Vol., Packaging, Price: 200 gm.
New Product–Documentation: Letter and Label sent by Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. Label. 2.5 by 3 inches. Black on white. "All natural ingredients–No preservatives."

1006. **Product Name:** Tangy Tofu "Cottage Cheese."
Manufacturer's Name: Soycraft.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. January.
Ingredients: Tofu, lemon juice, apple cider vinegar, sea salt, shoyu, vegetable oil, honey, natural herbs and spices.
Wt/Vol., Packaging, Price: 200 gm.
New Product–Documentation: Letter and Label sent by Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. Label. 2.5 by 3 inches. Orange on white. "All natural ingredients–No preservatives."

1007. Smith, Paul. 1984. Re: Pioneering work with soyfoods in Australia. Letter to William Shurtleff at Soyfoods Center, Feb. 7–in reply to inquiry. 2 p. Typed, with signature on letterhead.
• ***Summary:*** Answers to questions: "1. Soy products of Australia Pty. Ltd (Proprietary Limited) evolved from F.G. Robert's Health Food Company Pty. Ltd. F.G. Robert's Health Food Company was established in 1923 and Soy Products of Australia Pty. Ltd. was officially incorporated on the 19th June 1957. The company first started making soy foods in the mid nineteen thirties and the first Soyfood product was 'Soy Compound'.

"2. The company first started making debittered full fat soy flour in 1951-52. The company manufactures full fat soy flour only: raw or debittered depending on the end usage. Current output is several thousand tonnes per annum. We are not prepared to divulge process details, markets or the exact tonnages involved.

"3. We are the only manufacturer of full fat soy flour in Melbourne and in the State of Victoria, and we believe that we are the only manufacturer of debittered full fat soy flour in Australia. However, enzyme active or raw soy flour is widely used in bread improvers and bread manufacture in this country and several people in the other states produce raw full fat soy flour. We are not familiar with them all or their throughputs, and have no exact idea how we rank in size wise. We probably rank somewhere in the top three and we probably have the most specialized knowledge about handling and processing soy bean for human consumption." Address: Soy Products of Australia Pty. Ltd., 69 Power

Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1008. Jackobs, Joseph A.; Smyth, C.A.; Erickson, D.R. 1984. International soybean variety experiment: Eighth report of results, 1980-1981. *INTSOY Series* No. 26. xi + 234 p. Feb. (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** In the ISVEX trials, soybeans were tested in the following regions and countries: (For the years 1980/1981): Algeria, Argentina, Azores, Bangladesh, Bhutan, Bolivia, Brazil, Brunei, Burundi, Cameroon, Chile, China [actually AVRDC, Shanhua, Taiwan], Colombia, Costa Rica, Czechoslovakia, Ecuador, Egypt, Ethiopia, Fiji Islands, French Guiana, Gabon, Ghana, Guatemala, Guinea-Bissau, India, Indonesia, Iraq, Korea, Lesotho, Liberia, Libya, Madagascar, Malaysia, Mali, Mauritius, Mexico, Morocco, Mozambique, Nepal, New Caledonia, Pakistan, Panama, Paraguay, Peru, Philippines, Portugal, Puerto Rico, Rwanda, Saudi Arabia, Somalia, Sri Lanka, Sudan, Surinam, Tanzania, Thailand, Turkey, United States, Upper Volta, Uruguay, Vietnam, Zaire, Zambia, Zimbabwe.

(For the year 1979): Belize, Pakistan, Turkey, Vietnam.

Note 1. This is the earliest document seen (Aug. 2009) concerning soybeans in Guinea-Bissau, or the cultivation of soybeans in Guinea-Bissau.

This document contains the earliest date seen for soybeans in Guinea-Bissau, or the cultivation of soybeans in Guinea-Bissau (21 May 1981). Sixteen varieties were tested at Granja Prabis, Bissau. ICA Tunia gave the highest yield, 1,225 kg/ha.

Note 2: This document contains the second earliest date seen (Feb. 2006) for the cultivation of soybeans in Brunei (19 May 1981). Sixteen varieties were tested at Biray Research Station by cooperator W.T.H. Peregrine. UFV-1 gave the highest yield, 2,577 kg/ha.

Note 3: This is the earliest document seen (Feb. 2006) that describes soybean variety trials in Bhutan. On 30 April 1980 sixteen varieties were planted under the supervision of Mr. Heinz Burgin at the Rural Development Project Demonstration Farm, Bumthang, Bhutan. DeSoto gave the highest yield, 729 kg/ha. The source of all these soybeans was INTSOY for ISVEX trials.

1009. Quick, Graeme R. 1984. Ester-based fuels from vegetable oils. *Dep. of Agriculture, New South Wales, Advisory Note* No. 8/84. March. 2 p. Agdex 761.

• ***Summary:*** "This analysis suggests that, based on the opportunity cost of the oilseed crop, and on the minimal keeping quality and off-farm value of the meal, a producer would be far better off to sell his oilseed and purchase diesel fuel. There are still a number of unresolved questions about the use of ester-based fuels in diesel engines, and there is definitely no warranty from engine manufacturers if such materials are used as fuels in Australia.

"What are esters? The abbreviation 'esters' refers to interesterification or transesterification of triglyceride oils and fats to produce a lower-viscosity solvent which is more compatible with diesel engine systems than are the vegetable oils or animal fats from which they are derived." Address: Director of Agricultural Engineering, Agricultural Engineering Centre, Glenfield, Australia.

1010. **Product Name:** Tempeh Chips.
Manufacturer's Name: Soycraft.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. March.
Ingredients: Incl. tempeh.
New Product–Documentation: Letter from Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. "Our tempeh cabinets will be ready the first week of next month, however due to limited freeze facilities [freezer space] of the health food retailers, and our need to transport the product inter-state, we will produce the tempeh chips. Local tempeh is made, some in Queensland, some by an Indonesian restaurant, very, very small, servings, and expensive, so much so that local shops are giving up because of consumer reaction to price."

1011. **Product Name:** Piima (Made from Soymilk).
Manufacturer's Name: Soycraft.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. March.
Ingredients: Incl. soymilk and culture.
New Product–Documentation: Letter from Ralph and Volli Henderson, founders of Soycraft. 1984. Jan. 17. "Piima is on our list for the end of next month."

1012. **Product Name:** Bean Supreme Tofu [Bulk, or Vacuum Pack].
Manufacturer's Name: Bean Supreme Soyfoods.
Manufacturer's Address: P.O. Box 78-084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand. Phone: 09-764-988.
Date of Introduction: 1984. April.
Ingredients: Whole soybeans, water, natural coagulant.
Wt/Vol., Packaging, Price: Bulk, or 250 gm vacuum pack.
How Stored: Refrigerated.
Nutrition: Per 100 gm: Calories 121, moisture 76.9 gm, protein 12.0 gm, carbohydrate 3.4 gm, fat 6.7 gm, ash 1 gm, sodium 3.3 mg, calcium 170 mg.
New Product–Documentation: Poster. 1986. Letter from Alan Tam. 1986. Nov. 18. Bean Supreme makes about 1,000 to 1,500 lb/week of tofu. Form filled out by Trevor Johnston, Marketing Director. 1989. April. The company

started producing soyfoods in April 1984, and fresh bulk tofu was their first product. In Aug. 1984 they started vacuum pack tofu. They presently make 3,000 lb/month of the former and 7,000 lb/month of the latter. "Tofu is still growing, albeit slowly." The company is now Bean Supreme Ltd., Hugo Johnson Drive (P.O. Box 78-084), Penrose, Auckland, New Zealand. Phone: (09) 590 592. They are also involved with Bio Farm, Ro Quark, Spiral Foods, and Musashi. They also distribute other small manufacturers' products and import from Muso-Osaka.

Label for Bean Supreme Tofu, Firm Style. 1989. 6 by 7 inches. Purple and white on clear plastic bag. "High protein. Cholesterol and lactose free." Suggested uses: "Mash with seasoning to resemble cottage cheese. As a base for blended dressings or dips. Slice and marinate to fry or broil. Add to casseroles or savoury loaf, low calorie fruit whip, homemade ice cream or cheesecake. For recipe leaflet send stamped envelop to address below."

In about Feb. 1990 the company changed its name from "Bean Supreme" to "Down to Earth Natural Products Ltd." Bean Supreme will remain as a brand name for their existing and expanding range of traditional soy products.

1013. Oakenfull, D.G.; Topping, D.L.; Illman, R.J.; Fenwick, D.E. 1984. Prevention of dietary hypercholesterolaemia in the rat by soya bean and quillaja saponins. *Nutrition Reports International* 29(5):1039-46. May. [26 ref]
• ***Summary:*** Both saponins prevented dietary hypercholesterolaemia by increasing faecal excretion of steroids but their mechanisms of action was different. Soybean saponins increased fecal excretion of bile acids but had no effect on faecal excretion of neutral steroids. Both saponins may be of use in diets aimed at lowering plasma cholesterol. Address: 1&4. CSIRO Div. of Food Research, P.O. Box 52, North Ryde, NSW, 2113; 2-3. CSIRO Div. of Human Nutrition, Glenthorne Lab., O'Halloran Hill, SA 5158, Australia.

1014. Shurtleff, William; Aoyagi, Akiko. 1984. History of soy sauce, shoyu, and tamari. Soyfoods Center, P.O. Box 234, Lafayette, CA 94549. 118 p. June 6. Unpublished typescript.
• ***Summary:*** A comprehensive history of the subject. Contents: What is soy sauce? Etymology. World overview. Part I: History of soy sauce in China and Taiwan. Early Chinese soy sauces (shih-you and jiangyou). The 1800's. 1900-1948. 1949-1980's (People's Republic of China). Taiwan. Hong Kong. Part II: History of soy sauce in Southeast Asia and Korea. Dissemination and common characteristics. Association of Southeast Asian Nations (ASEAN)–general. Philippines (1912-). Thailand (1974-). Malaysia (1970-). Singapore. Indonesia. Vietnam. Korea. Part III: History of shoyu in Japan. Hishio (jiang), tamari, and other forerunners of shoyu (700-1600). The development of shoyu (1500-1700). Standardization of the shoyu formula (1716-1867). The rise of shoyu in Japan (1750-1867). Overview of origins. Shoyu during the Meiji period (1868-1911). Shoyu from 1912-1945. The postwar period and modern times (1945-1981). Part IV: History of soy sauce in Europe. Part V: History of soy sauce in Australasia and the Pacific. Part VI: History of soy sauce in the United States. Part VII: History of soy sauce in Latin America, Africa, the Indian Subcontinent, and the Middle East. Address: Lafayette, California. Phone: 415-283-2991.

1015. Wilson, Geoff. 1984. Soymilk "bomb" primed to scatter dairy hopes. *National Farmer (Australia)* No. 11. June 14-27. p. 24-26. New Series.
• ***Summary:*** "The development of a soybean milk indistinguishable from cow's milk poses the most serious threat to dairying in nearly 20 years–its like a time bomb on a fast clock... The impact of soymilk on this country's dairy industries is likely to make the margarine wars of the late 1960s look like a kindergarten spat... And even now one of Australia's biggest dairy co-operatives is planning to be ready to swing into soymilk production next year... Soymilk made for about 13 cents a litre puts it at about half what most Australian dairymen now receive for market milk..." Address: P.O. Box 283, Caulfield South, 3162 Victoria, Australia.

1016. Wilson, Geoff. 1984. Expatriate Australians boosting soy. *National Farmer (Australia)* No. 11. June 14-27. p. 25. New Series.
• ***Summary:*** John Wilson, who developed the Alfa-Laval soymilk system, is now based in Lund, Sweden. Owen Price is managing director of the Dairy Farm group of companies in Hong Kong. He is guiding his company toward soy products. "The first formulation he admits to is a soy ice-cream well suited to the expanding Hong Kong market. Others can be expected. However Price may well become a force in the supermarket selling of soymilk foods in Australia, as part of his company controls 106 supermarkets in Australia (as well as 140 supermarkets in Asia)–through Franklins in Australia, noted for its cut-price retailing, and its rapid expansion into Queensland and Victoria." Address: P.O. Box 283, Caulfield South, 3162 Victoria, Australia.

1017. Wilson, Geoff. 1984. Soybeans poised for big growth [in Australia]. Crop opportunity. *National Farmer (Australia)* No. 11. June 14-27. p. 26. New Series.
• ***Summary:*** The Bureau of Agricultural Economics predicts a 1984/85 soybean crop of 92,000 tonnes, up from 77,000 tonnes the year before, and 37,000 tonnes two years ago. Dr. Ken McWhirter of the NSW University sees a bright future for the irrigated areas around the Murray in Victoria and NSW. The greatest opportunities lie with irrigated

soybeans. "Some of our figures show soy has the biggest cash yield of per megalitre of water of any enterprise." Presently the average cost of producing irrigated soybeans in Australia is about $350/hectare, with a return of about $1,000/ha. Address: P.O. Box 283, Caulfield South, 3162 Victoria, Australia.

1018. **Product Name:** Soygran.
Manufacturer's Name: Soycraft Pty. Ltd.
Manufacturer's Address: P.O. Box 420, Woollahra (near Sydney), NSW 2025, Australia. Phone: (02) 32 0716.
Date of Introduction: 1984. June.
New Product–Documentation: Form filled out by Volli and Ralph Henderson. 1984? (Undated). The company now produces Soysage, Soygran, Tofu Pate, Tofu Cottage Cheese, Missing Egg Salad, Piima, and Tempeh Chips.

1019. *International Agriculture Newsletter (Univ. of Illinois).* 1984. Theodore Hymowitz, Agronomy, will collect seeds of wild species of Glycine in Australia. July. p. 2.
• ***Summary:*** Hymowitz will collect in the Cape York Peninsula from July 17 to Aug. 4.

Note 1. An earlier letter from Dr. Hymowitz dated 20 Sept. 1983, states "The plant collecting trip to the Cape York Peninsula, Queensland, Australia was quite interesting. I believe we collected 5 species representing diverse habitats." Thus the trip announced in this article must not have been his first to the area.

Note 2. A subsequent letter from Dr. Hymowitz dated 22 Dec. 1984 states: "The trip to Australia was very exciting. We collected a couple of unknown *Glycine* species. Next year I hope to be collecting soybean land races in Nepal."

1020. Shurtleff, William; Aoyagi, Akiko. 1984. History of tempeh: A fermented soyfood from Indonesia. Lafayette, California: Soyfoods Center. 81 p. July 17. No index. 28 cm. 2nd ed. 1985. 91 p. [375 ref]
• ***Summary:*** Contents: 1. Introduction. 2. Etymology. 3. World Overview. 4-8. History of Tempeh in Indonesia. 9-11. History of Tempeh in Europe and Australia. 12-15. History of Tempeh in the United States and Canada. 16-18. History of Tempeh in Japan. 19-23. History of Tempeh in Asia (China, Taiwan, Southeast Asia, India, Sri Lanka). 24. History of Tempeh in Latin America. 25. History of Tempeh in Africa. 27. International Interest. 28. U.S. and Third World Problems.

The world's largest tempeh manufacturers are as follows:

Company name, Country, Year Started, Avg. Weekly Production

1. Marusan-Ai, Japan, 1983, makes 15,148 lb/week = 6,885 kg/week

2. Tempe Production Inc., Netherlands, 1969, makes 13,200 lb/week = 6,000 kg/week

3. Quong Hop/Pacific Tempeh, USA/CA, 1980, makes 7,000 lb/week = 3,182 kg/week

4. White Wave, USA/CO, 1979, makes 5,850 lb/week = 2,659 kg/week

5. Soyfoods Unlimited, USA/CA, 1981, makes 5,800 lb/week = 2,636 kg/week

6. Torigoe Flour Milling, Japan, 1983, makes 5,770 lb/week = 2,623 kg/week

7. The Tempeh Works, USA/MA, 1979, makes 5,500 lb/week = 2,500 kg/week

8. Marukin Foods, Japan, 1983, makes 4,620 lb/week = 2,100 kg/week. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

1021. Tindale, Mary D. 1984. Two new eastern Australian species of *Glycine* Willd. (Fabaceae). *Brunonia* 7(1):207-13. Sept. 12. [4 ref]
• ***Summary:*** The two new species are *Glycine argyrea* and *G. cyrtoloba*. Address: Royal Botanic Gardens, Mrs. Macquarie's Rd., Sydney, N.S.W. 2000, Australia.

1022. Ahmad, Q.N.; Britten, E.J.; Byth, D.E. 1984. The karyotype of *Glycine soja* and its relationship to that of the soybean, *Glycine max*. *Cytologia (Tokyo)* 49(3):645-58. Sept. [11 ref]
• ***Summary:*** The authors report that the total length of the chromosome component of *Glycine soja* is about 6-7% smaller than that of *Glycine max*. Address: 1. Dep. of Genetics and Plant Breeding, Bangladesh Agriculture Univ., Mymensingh, Bangladesh; 2-3. Dep. of Agriculture, Univ. of Queensland, St. Lucia, Queensland, Australia.

1023. Plucknett, Donald L.; Blase, M.G.; Campbell, T.A. 1984. Amaranth: Modern prospects for an ancient crop. Washington, DC: National Academy Press. vii + 80 p. 23 cm. Report of an Ad Hoc Panel of the Advisory Committee on Technology Innovation, Board on Science and Technology for International Development, Office of International Affairs, National Research Council, National Academy of Sciences.
• ***Summary:*** Contents: Introduction. The plants. Production. Grain amaranths. Vegetable amaranths. Research needs. Appendixes: A. Selected readings. B. Research contacts. C. Germplasm collections and commercial seed suppliers. D. Biographical sketches of panel members.

"In pre-Columbian times grain amaranth was one of the basic foods of the New World–nearly as important as corn and beans. Thousands of hectares of Aztec, Inca, and other farmland were planted to the tall, leafy, reddish plants. Some 20,000 tons of amaranth grain were sent from 17 provinces to Tenochtitlan (present-day Mexico City) in annual tribute to the Aztec emperor Montezuma... A century ago, the soybean, sunflower, and peanut were considered unworthy of concentrated research. Today, they are among the world's most important crops. Amaranth, too, could rise to universal prominence.

"Three species of the genus *Amaranthus* produce large seedheads loaded with edible seeds. *Amaranthus hypochondriacus* and *Amaranthus cruentus* are native to Mexico and Guatemala; *Amaranthus caudatus* is native to Peru and other Andean countries...

"With a protein content of about 16 percent, amaranth seed compares well with the conventional varieties of wheat (12-14 percent), rice (7-10 percent), maize (9-10 percent), and other widely consumed cereals. Amaranths began attracting increased research attention in 1972 when Australian plant physiologist John Downton found that the seed also contains protein of unusual quality. It is high in the amino acid lysine."

One exciting potential of amaranth grain lies in its high protein content as compared with other grains: Amaranth 16% (mean; range 12-19%), rye 13% (range 9-18%), oats 12% (range 7-23%), barley 10% (range 8-21%), wheat 10% (8-19%), corn 10% (range 8-17%), rice 7% (range 7-10%). Another virtue is the high content of lysine and methionine, two essential amino acids. The lysine content of amaranth is 0.82%, compared with oats (the next highest grain) 0.5%, rye 0.4%, barley 0.4%, wheat 0.36%, rice 2.8%, and corn 2.5%.

"Vegetable amaranths: Seed is not the only nutritious product from the versatile amaranth. The leaves also are rich in protein as well as in vitamins and minerals... Although virtually unlisted in agricultural statistics, vegetable amaranths may actually be the most popularly grown vegetable crop in the tropics.

"In the hot, humid regions of Africa, Southeast Asia (especially Malaysia and Indonesia), southern China, southern India, and the Caribbean, amaranth species such as *Amaranthus tricolor, Amaranthus dubius*, and *Amaranthus cruentus* are grown as soup vegetables or for boiled salad greens (potherbs). In North American deserts, where summers are too hot for lettuce or cabbage production, *Amaranthus palmeri* has long been a major wild green among Indians. In Greece, boiled *Amaranthus blitum* leaves have been a favorite salad (called vleeta) since the days of Homer...

"Leading amaranth's development is the Rodale Research Center near Emmaus, Pennsylvania, where more than a thousand different accessions collected from all parts of the world are being bred, grown, and evaluated." Address: Washington, DC.

1024. **Product Name:** Tempeh.
Manufacturer's Name: Frank Barker Tempeh Co.
Manufacturer's Address: c/o Post Office Cowarumup 6284, Western Australia.
Date of Introduction: 1984. October.
New Product–Documentation: Letter from Frank Barker. 1985. Feb. 25. Has been making tempeh commercially for 4 months.

Talk with (call from) Frank Barker of Tally-Ho Farm. 1994. June 15. A disastrous fire has just burned down his tempeh plant and his offices. He is thinking of re-locating in Perth.

Form filled out by (fax from) Frank Barker. 2001. July 2. Tallyho Farm is making tempeh. Located at 3 Cullen St., Bayswater, Western Australia 6053. Phone: 08 9371-9840. Persons in charge: Frank Barker and C.T. Cheong.

1025. *Power Farming Magazine (Sydney, Australia).* 1984. Product report: Alternate fuel could save money. 93(10):10. Oct.

• ***Summary:*** A low-cost fuel based on vegetable oils, known to have potential for more than 89 years, may offer significant savings compared with petroleum distillate. The fuel is based on a new scientific development, which uses a catalyst then removes the catalyst at the end of the process. This reduces the viscosity of the vegetable oil from about 8 times that of distillate-based fuels to about the same.

"Now the two fuels, Bio-Diesel and distillate, are virtually identical."

Note: This is the earliest English-language document seen (May 2007) that contains the word "Bio-Diesel" (regardless of capitalization or hyphenation). The evidence indicates that this word was coined in 1984 by: Bio-Energy (Australia) Pty. Ltd. 155 Rath Road North, Kirrawee, N.S.W. 2232, Australia.

1026. **Product Name:** Tempeh.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1984. November.
Ingredients: Organic soybeans, water, cider vinegar, and culture *(Rhizopus oligosporus)*.
Wt/Vol., Packaging, Price: 250 gm in plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Nov. 1984. Red, green and white on yellow. Front panel: "Nutritious. Cholesterol free. Frozen fresh natural. Fitness food. Fry, bake, grill or steam for a quick and easy meal. Fitness food. Bermutu Tinggi."

1027. *SoyaScan Notes.* 1984. Early tofu manufacturers in Europe, listed chronologically by country (Overview). Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** All of the following started making tofu before 1985. Countries with the earliest tofu manufacturing are listed first. The month production started, when known, is given after a slash following the year. Thus 1977/09 is Sept. 1979.

France: Usine de la Caséo-Sojaine (run by Li Yu-ying) 1911/05, Two or three tofu shops in and around Paris, including 1-2 at Colombes 1964/03, Alimentation Japonais Osaka 1972, Le Bol en Bois 1975/12, La Rousselie 1978/02, Institut Tenryu 1981/01, Société Soy 1982/06, Les Sept Marches 1982/09, Sojatour Tofu Shop 1982/09, Ets. Co-Lu 1983/06, Lagadec Tofu 1983/06, Soja d'Oc 1983/10, Nyingma Dzong 1983/11, Tofu Kuehn 1983?, Sojagral Ouest 1984/12.

Netherlands: Vanka-Kawat 1958, FA. L.I. Frank: Frank Soya 1959?, Heuschen B.V. 1964, Firma Post & Teekman 1965, Stichting Natuurvoeding Amsterdam (renamed Manna Natuurvoeding B.V. in 1982) 1977/09, Hwergelmir: Foundation for a Natural Life 1979/07, Firma Ergepe 1981/01, Stichting Oost West Centrum 1981/01, Michel Horemans Tofu 1981/01, Witte Wonder Products 1981/04, De Morgenstond 1981/12, Soy-Lin or F.M. Lin 1982/09. Jakso: Center for Agriculture & Craftsmanship (later called Yakso) 1983/06, Vuurdoop 1983/07.

England, UK: Dragon & Phoenix Co. 1966, Wong Chung 1975 or before, Lung Kee 1975 or before, Full of Beans Wholefoods 1978/08, Paul's Tofu & Tempeh 1981/01, Yu's Tofu Shop 1981/01, Cauldron Foods Ltd. 1981/09, The Regular Tofu Co. Ltd. 1981/12, Bean Machine (Wales) 1982, Hong Kong Supermarket 1982/09, Stewart Batchelder Tofu 1983/06.

Belgium: Etablissements Takanami (Takanami Tofu Shop) 1976, Jonathan P.V.B.A. 1977/01, De Brandnetel 1979/07, Unimave Tofu 1980, Aversano Tofu Shop 1981/01, Alternatur 1981/01, Seven Arrows Tofu 1982/04, 1983/10, Vajra 1983/11.

Switzerland: La Moisson 1978, Le Grain d'Or 1981/01, Genossenschaft Sojalade (later renamed Genossenschaftstofurei) 1981/09, Soyana 1982/02, Soy Joy 1982/04, Restaurant Sesam 1982/04, Opplinger Tofu 1982/09, Natural Products Promo Carouge 1982/09, Joya 1982/09, Centre Macrobiotique de Lausanne 1982, Osoja: La Maison du Tofu (later renamed Tofushop Centanin SA) 1983, Tofurei Pfannenstiel 1983/11, Thieu's Soja Spezialitaet 1983/11, Conserves Estavayer S.A. (Sold at Migros Supermarkets) 1984/06, Galactina Ltd. 1984/11, Berner Tofurei 1984?

Italy: Roland A. di Centa 1978, Gilberto Bianchini of Centro Macrobiotico ed Alimentazione Organica (Community Food). Renamed Centro Macrobiotico Tofu 1978/11, Ohnichi Intl. Foods Co. Lotizzazione Industries 1982/09, Circolo L'Aratro 1982/09, C.D.S. Pianetta Terra Soc. Coop. A.R.L. 1982/12, Aldo Fortis Tofu 1983/06, Fondazione Est-Ouest 1983/06.

Germany: Svadesha Pflanzen-Feinkost 1979, Alexander's Tofu Shop [Nabben] 1981/01, Biogarten 1981/01, Auenland Tofu & Soja Produkte 1982/03, Tofuhaus Belsen (renamed Yamato Tofuhaus Sojaprodukte in Jan. 1984) 1982/07, Thomas Karas und Ingeborg Taschen (associated with Bittersuess; renamed Soyastern Naturkost GmbH in Dec. 1985) 1982/11, Albert Hess Tofuhaus Rittersheim (Later in Tiefenthal) 1983/07, Tofukost-Werk TKW GmbH 1984/05, Christian Nagel Tofumanufaktur 1984/08, Sojatopf (renamed Soto in April 1989) 1984/09.

Austria: Weg Der Natur 1980/05, Tofurei Wels (renamed Schoen Tofurei in 1987) 1982, SoyVita Austria 1983/05, Taiwan Restaurant 1983/06, Walter Brunnader Tofu 1983/06, Soyarei–Erich Wallner Tofu 1983/06, Tofurei Ebner 1983/11, Soyarei Wallner Ebner 1984/02, Fernkost Markt Nippon Ya Kondo GmbH 1984/02, Naturkostladen 1984/02, Sojarei Ebner-Prosl 1984/04, Sojvita Produktions GmbH 1984/06.

Sweden: Aros Sojaprodukter 1981/02.

Denmark: Tofu Denmark (Soy Joy?) 1982/03, Dansk Tofu 1983/06.

Portugal: Unimave Tofu 1980, Shogun Produtos Aliment. 1982/09, Jose Parracho Tofu 1982/09, Próvida Lda. 1984.

Spain: Zuaitzo 1984/03.

1028. **Product Name:** Pureharvest Organic Soy Drink [Natural, Vanilla, Barley Malt plus Other Flavors].
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor). Made in Japan.
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1984. December.
Wt/Vol., Packaging, Price: 500 ml Doypack stand-up retort pouch.
How Stored: Refrigerate after opening.
New Product–Documentation: Australian Dairy Foods. 1985. Feb. p. 51. "Soy report." Over the past year sales have increased greatly. Also distributing Morinaga Tofu. Don Lazzaro is director of this company.

STS. 1985. Containers for Soymilk. Shows color photo of package. Brown, yellow, and orange.

Australian Dairy Foods. 1986. Feb. p. 84. Shows two sizes of Tetra Brik cartons, each vanilla flavor.

Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In Dec. 1984 they introduced Pureharvest soymilk in vanilla and natural flavors, in 500 ml Tetra Brik cartons, made by and imported from Kibun in Japan.

Letter (fax) from Daniel Hannaford of Ceres Natural Foods Pty. Ltd. The company's brand is Pureharvest. They apparently import soymilk from Mitoku. The address is now 18 Ardena Court, P.O. Box 187, East Bentleigh, Victoria 3165, Australia. Phone: (03) 579 3422.

1029. Jackobs, J.A.; Smyth, C.A.; Erickson, D.R. 1984. International soybean variety experiment: Ninth report of

results, 1982. *INTSOY Series* No. 27. xiv + 103 p. Dec. (College of Agric., Univ. of Illinois at Urbana-Champaign).
• ***Summary:*** In the ISVEX trials, soybeans were tested in the following countries: (For the year 1982) Afghanistan, Azores, Bangladesh, Burma, Cameroon, Chile, China (Taiwan, ROC), Colombia, Cyprus, Dominican Republic, Ecuador, Egypt, French Guiana, Gabon, Ghana, Guatemala, Indonesia, Ivory Coast, Korea, Madagascar, Mauritius, Mexico, Morocco, Mozambique, Nepal, New Caledonia, New Hebrides, Nicaragua, Pakistan, Paraguay, Portugal, Puerto Rico, Reunion, Rwanda, Saudi Arabia, Senegal, Somalia, Sudan, Swaziland, Thailand, Turkey, United States, Uruguay, Vietnam, Yugoslavia, Zaire, Zambia, Zimbabwe.

(For the year 1981) Australia, Rwanda.

1030. Dickson, T. 1984. Japanese soybean research institutes, including the First International Symposium on Soybeans in Tropical and Subtropical Cropping Systems, Tsukuba, Japan, 26 September to 1 October 1983. Brisbane: Queensland Dept. of Primary Industries. i + 10 p. Study tour report. 30 cm. *
Address: Australia.

1031. **Product Name:** Tempeh.
Manufacturer's Name: Light Wave Wholefood.
Manufacturer's Address: 21 Gilbert St., Newton, Adeliade, SA 5074, Australia.
Date of Introduction: 1984.
New Product–Documentation: Letter from Dominic Anfiteatro of Light Wave Whole Foods, Adelaide. 1983? (undated). He has been a vegan for 8 years. He learned about tempeh during a 7½-week grape and water fast from *The Book of Tempeh*, by Shurtleff and Aoyagi. Then he traveled to Indonesia to learn more about making tempeh. He was there just after Mt. Galungung in West Java erupted for the first time (about 1982?). He smuggled some indigenous mixed-culture tempeh starter *(biang ragi)* into Australia and "made hundreds of batches of tempeh for myself and for Adelaide." He ran a vegetarian restaurant and juice bar from which he introduced tempeh to many people. He orders a copy of the book *Tempeh Production*. He also made tapeh using organic brown rice, or cassava.

Label. 1984, undated. 4.5 by 5 inches. Red and black on white. "A Cultured Soyabean Food." 250 gm. Letter from Dominic Anfiteatro. 1985. May 2.

1032. McGuinness, E.E.; Morgan, R.G.H.; Wormsley, K.G. 1984. The effects of soybean flour on the pancreas of rats. *Environ. Health Perspect* 56:205. *
• ***Summary:*** Soy, which provides the precursor for equol biosynthesis, has been shown to promote pancreatic cancer in experimental animals. Address: Dep. of Physiology, Univ. of Western Australia, Nedlands, WA, 6009.

1033. **Product Name:** Mountain Mist Tempeh.
Manufacturer's Name: Mighty Bean Soyfoods.
Manufacturer's Address: M.S. 1117, Cooloolabin, via Yandia, QLD 4561, Australia.
Date of Introduction: 1984.
New Product–Documentation: Label. 1984, undated. 3.5 by 4 inches. Orange on yellow. "Product of Sunshine Coast, Australia."

1034. **Product Name:** [Pure Harvest Soy Drink].
Manufacturer's Name: San-iku Foods.
Manufacturer's Address: Sodegaura-machi, Chiba-ken 299-02, Japan.
Date of Introduction: 1984.
Ingredients: Whole soybeans, barley malt, pearl barley malt, wheat germ, safflower oil, sea salt.
Wt/Vol., Packaging, Price: Retort pouch.
How Stored: Shelf stable.
New Product–Documentation: Shurtleff & Aoyagi. 1984. Soymilk Industry & Market. p. 47. "San-iku Foods has been exporting Pure Harvest Soy Drink to Australia for several years."

Letter from San-iku Foods. 1990. June. This product was introduced in 1984.

1035. **Product Name:** Sanitarium Health Foods B-B-Q Links (Vegetarian Hot Dogs).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, Sydney 2076, NSW, Australia.
Date of Introduction: 1984.
Ingredients: Textured vegetable protein, vegetable oil, coconut oil, whey protein concentrate, egg albumin, torula yeast, modified starch, sauce, salt, dried autolysed yeast, onion powder, garlic powder, water added.
Wt/Vol., Packaging, Price: 430 gm.
New Product–Documentation: Letter with Label from Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1984. Label is 10 by 4 inches. Red, yellow, black, and green on white. A color photo shows 3 links on a bed of scrambled eggs on a white plate with a half tomato and some small squash.

1036. Sims, Ralph E.H.; Meister, A.D. 1984. Production and economics of rapeseed oil and tallow esters as alternative fuels for compression ignition engines. *Energy in Agriculture (Netherlands)* 3:323-32. [8 ref]
• ***Summary:*** Contents: Abstract. Introduction. Rapeseed oil: Economics. Tallow esters; economics. Conclusions. Acknowledgements. Rapeseed oil is too expensive relative to diesel. However tallow, which is presently being "produced in large volumes as a by-product of the meat industry and exported mainly for soap and candle

manufacture, could be converted into esters as a total cost less than the ex-refinery diesel price.

In 1979, the original work on tallow and rapeseed oil fuels in New Zealand was begun at Massey Univ. Address: 1. Dep. of Agricultural / Horticultural Mechanisation; 2. Dep. of Agricultural Economics. Both: Massey Univ., Palmerston North, New Zealand.

1037. Bhumiratana, Amara. 1984. ASEAN Protein Project, 1974-1984. Bangkok, Thailand: ASEAN Subcommittee on Protein. 111 p. Illust. 29 cm. [Eng]

• ***Summary:*** The ASEAN nations are Indonesia, Malaysia, the Philippines, Singapore, and Thailand. Contents: 1. Malnutrition problems in ASEAN countries (incl. Soy-based products as a solution to malnutrition). 2. Administration of the ASEAN Protein Project. 3. Objectives. 4. Methodology. 5. Results of ASEAN member country research: Soy products developed (high-protein, low-cost foods for infants and children, soy milk and soy milk powder, full-fat soy flour), fermentation products developed (tempe: from shophouse business to modern factory, oncom chips and flour, soy sauce, the ASEAN culture collection), other related projects, exchange of information (incl. details on the 15 ASEAN protein workshops held between July 1975 and Oct. 1984, and the publications resulting from each). 6. New ASEAN projects. 7. Conclusion.

This book, which contains many color photos and focuses on soybeans, describes one of the most successful ASEAN programs, emphasizing cooperation among the ASEAN nations in an attempt to solve the problem of malnutrition common to the region. The project, conceived in Aug. 1971, receives major funding and technical assistance from the Australian government. In May 1978 the ASEAN Full-Fat Soy Flour (FFSF) Factory in Chiang Rai, Thailand, was completely installed and has been producing continuously since then. It has a capacity of 100 tons/month. Numerous photos of the facility are shown. A pilot plant has produced up to 50 tons/month of Kaset Infant Food, which has been well accepted in 573 health centers throughout Thailand and is being evaluated in other ASEAN countries. A photo of the package (plastic bag) is shown. Address: Bangkok, Thailand.

1038. *CRT Farmers Annual (Australia).* 1984. Farm produced diesel fuel. p. 84.

• ***Summary:*** Every farmer must be interested in the idea of growing his own diesel fuel–especially if the cost is about half the current price of petroleum based distillate.

"Commercial reality: A self-contained, on-farm process developed by Bio-Energy (Australia) Pty. Ltd, headquartered in Sydney, has now reached a stage of commercial reality; it is called Bio Fuel.

"According to the company's Managing Director, Mr. Max Strong, the Bio-Energy process has already attracted a great deal of attention from a number of farmers, a large mining company and sources in the Pacific Islands."

"Continuing, Mr. Strong said, 'Completely satisfactory diesel fuels can be made from a range of oil seeds, well known to Australian farmers, such as soya bean, rape seed, linseed, peanuts, safflower and sunflower."

A flow-diagram shows the process, which results in esterified vegetable oil with a catalyst added, then removed. A photo shows the equipment. An illustration shows the "Bio Energy" logo.

1039. Grant, J.E.; Grace, J.P.; Brown, A.H.D.; Putievsky, E. 1984. Interspecific hybridization in *Glycine* Willd. subgenus *Glycine* (Leguminosae). *Australian J. of Botany* 32(6):655-63. [17 ref]

• ***Summary:*** The meiotic configurations of 12 new hybrid combinations among 8 perennial *Glycine* species were analysed. These and other data showed close genomic relationships among the diploid species *G. canescens, G. clandestina,* and *G. latrobeana* and the euploid tetraploid *G. tomentella.* This information is used to suggest the major evolutionary groupings within the subgenus *Glycine.* Address: 1-3. Div. of Plant Industry, CSIRO, G.P.O. Box 1600, Canberra, ACT 2601 Australia; 4. Div. of Medicinal and Spice Crops, Agricultural and Research Organization, Newe Ya'ar Exp. Station, Israel.

1040. Khamoui, Thao. 1984. Cassava for feed on Guam: Review and analysis. *Univ. of Guam, College of Agriculture and Life Sciences, Agricultural Experiment Station, Technical Report* No. 33. 35 p. [56* ref]

• ***Summary:*** Soy is listed throughout this report (on pages 3-4, 9, 14-15, 20-22, 25, 28-29) as a source of high quality low cost protein in livestock rations. There is no indication, however, that soybeans have ever been cultivated on Guam or that soy products have ever appeared on Guam. Address: Agricultural Exp. Station, College of Agriculture and Life Sciences, Guam Univ., Mangilao, Guam 96923.

1041. SilverPlatter Information, Inc. 1984—. AGRISEARCH (Computerized databases). [75000* ref. Eng]

• ***Summary:*** AGRISEARCH incorporates five databases covering agriculture, food, and nutrition–worldwide. The five are: CRIS from the U.S. Department of Agriculture (USDA); ICAR (Inventory of Canadian Agri-Food Research) from the Canadian Agricultural Research Council; ARRIP (Australian Rural Research in Progress) from the Australian Standing Committee on Agriculture; SIS from the Special Program for African Agricultural Research (SPAAR, World Bank, Washington, DC); and AGREP (the permanent inventory of AGricultural REsearch Projects) from the Commission of the European Communities. The coverage is up to 10 years and the database contains 75,000+ records. About 5,000+ records are added annually. Address: 100 River Ridge Dr., Norwood, Massachusetts 02062-9742. Phone: 1-800-343-0064.

1042. Bio-Energy (Australia) Pty. Ltd. 1984? Subject: Low cost diesel fuel (Brochure). Kirrawee, N.S.W., Australia. 4 p. 28 cm. Undated.

• ***Summary:*** On the front page, below the title, against a background of mature soybeans: "Bio Energy Bio-Diesel. The economics. The equipment. The benefits. The fuel source. Engine performance."

On the two-page spread inside: "Low cost diesel fuel, Bio-Diesel, is the culmination of long research coupled with newly developed and patented production processing using vegetable oils as the raw material." Each of the main points on the cover is then explained in detail; the term "Bio-Diesel" is used repeatedly. A large photo shows the equipment with the caption: "Bio-Diesel technology makes low cost diesel fuel production a reality Now." The section titled "The fuel source" states: "Diesel fuels can be made from a range of oil seeds including safflower, soybean, rape seed, linseed, cotton seed, peanut, sunflower, and cotton oils. The new Bio-Diesel is simply based on processed vegetable oils." A flow-diagram shows the process, which results in esterified vegetable oil with a catalyst added, then removed. Address: 155 Rath Road North, Kirrawee, N.S.W. 2232, Australia. Phone: (02) 542 3444.

1043. **Product Name:** Tofu, Tofu Products, and Tempeh.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia. Phone: +61 2 597-4120.
Date of Introduction: 1985. January.
New Product–Documentation: Communication from Tony Wondal of Nutrisoy. 1987. May. He started Jan. 1985. Total production is 900 lb/week.

Soya Bluebook '94. p. 66. Contact Tony Wondal, managing director. The company makes simulated meat products (analogs); soyfoods, tempeh, tofu & tofu products, other soy-based foods. Exporter: Whole soybeans; split, dehulled. Importer: Organic soybeans.

1044. *Australian Dairy Foods.* 1985. Soy report: Soy blends to overcome disadvantages? Frozen soybean desserts. Technology is here for soy beverages. Feb. p. 46.

• ***Summary:*** Blends of soymilk and dairy milk are being considered in Australia. Address: Australia.

1045. *Australian Dairy Foods.* 1985. Soy report: Six new soy drinks expected. Soy products will enter market. Feb. p. 48.

• ***Summary:*** The first Australian soy drink last year was "Golden Life," a "sport food" launched by Martin Pharmaceuticals in Tetra Brik cartons. Also concerns: Anders Linder of STS-Soya Technology Systems, Rajasoya, Vital, Soyvita, Granose. Address: Australia.

1046. *Australian Dairy Foods.* 1985. Soy report: Tofutti is tantalising U.S. tastebuds. Flavored soy drinks selling well. Feb. p. 51.

• ***Summary:*** "Americans are devouring 180,000 litres of Tofutti a week."

Ceres Natural Foods Pty. Ltd. in East Bentleigh, Victoria, Australia is currently distributing 7 varieties of soymilk plus a Tetra Pak tofu. Mr. Don Lazzaro is the company's director. Address: Australia.

1047. Boyer, Robert A. 1985. Reminiscences: Automotive design–Oral history project. Dearborn, Michigan: Henry Ford Museum and Greenfield Village. 130 p. Accession #1673.

• ***Summary:*** This is the transcript of an interviews conducted by Dave Crippen of the Henry Ford Museum on 7 Feb. 1985 at Mr. Boyer's home in Dunedin, Florida. It covers all aspects of Boyer's work with soybeans at the Ford Motor Co., including: Growing up in Royal Oak, Michigan; his father worked in the accounting department of the Ford Motor Co. at Highland Park, Michigan (p. 1). Boyer's first meeting with Frank Campsall (p. 2). Growing up at the Wayside Inn (the oldest hotel in America, in South Sudbury, Massachusetts, p. 1-6). Attending high school in Framingham, Massachusetts (p. 6). First meeting with Henry Ford when the two ice skated together on the mill pond behind the Wayside Inn (p. 7). Moving to Dearborn in Sept. 1927 to attend Ford's Trade School (p. 7-11). Early work at the chemical plant (quarter-size model of Iron Mountain plant) in Greenfield Village (p. 12-13). Ford's trip to Germany [Peace Ship to Europe, in 1915 during World War I?] crystallized a lot of his thinking. The Great Depression and the origins of his chemurgic thinking. In 1934 the first National Chemurgic Conference was held at Dearborn Inn; Boyer was in charge of the program. Mr. Irenee DuPont attended and Mr. Ford spent a lot of time with him. Before that, the DuPonts and the big banks did not trust Ford. (p. 14). Opening of Greenfield Village in late 1929 on the 50th anniversary of Edison's first successful light bulb (p. 15). Chemical experiments on truckloads of farm crops using a retort; Frank Calvert (p. 16-19).

Experiments starting in about 1933 using hexane as a solvent to extract the oil from soybeans; the Ford Extractor (p. 20-23). Boyer's group wanted to get pure protein from soybeans. So "in the lab we developed our own process for extracting the oil... We used hexane solvent, like dry cleaning. We'd flake the beans and run them through a pipe that was full of hexane on an angle with a screw in it." Hexane solvent is "distilled out of petroleum. It has a very narrow boiling point–66° centigrade. The Ford extractor...

got quite a lot of attention. We built it across the street from the chemical plant. It was about 150 feet away. Mounted it all by itself because everybody was afraid of fire." A roof was built over it but no walls. It was probably built in about 1933.

In 1933 at the World's Fair [sic, the Ford Exposition of Progress] in New York City, Boyer's group had a glass model (on a table) of this extractor that used hexane solvent.

Note: Ford boycotted Chicago's A Century of Progress Exposition which opened in 1933, in part to call attention to the company's 30th anniversary; he held his own "industrial fair," first in Detroit and then in New York, in late 1933. *Business Week* described it as "the greatest industrial show ever held." Some 2.3 million people attended the two-week show in New York.

A working model of the Ford extractor, using hexane solvent, was at the Chicago World's Fair, starting in mid-1934, in the Ford Industrial Barn. "They would never let you do that today. Too dangerous."

Research on purified soy protein and soy plastics with formaldehyde; Bakelite (p. 24-25). Use of soy oil for foundry core binders for casting the Ford V-8 engine block; thus, the soy experiments are now commercialized. Building a 50 ton/day extractor (p. 26-27). Spinning soy protein fiber like rayon, based on spinning milk protein in Italy. Using the fibers to make wrinkle resistant synthetic wool, a suit of clothes for Henry Ford and others, overcoats, neckties, felt hats. "We also found that these fibers blended in very well with rabbit fur for making men's felt hats. So the Hat Corporation of America took all the fiber we could make. It wasn't very much and they would blend it in with rabbit fur. And they actually had them [the men's felt hats] on the market." Rabbit fur is very expensive (p. 29-36). Ford's suit of clothes contained 65% wool and 35% soy fiber. Boyer leaves Ford Motor Co. in 1943. Problem with fiber was tensile strength, especially wet strength. Ford's interest in this fiber work and his fitness at age 75 (p. 37-38). Ford "was not a true vegetarian but he was pretty close" (p. 38). Edsel Ruddiman's work with foods (p. 39-47). Boyer and Ruddiman attend American Soybean Assoc. soybean conference in Washington, DC [in Sept. 1932] where they saw "leather-like products that the Chinese make" [yuba]. Boyer tried unsuccessfully to use the idea to make "synthetic leather." USDA's experimental farm in Holgate, Ohio, where many soybeans sent back by W.J. Morse were tested (p. 40-42). Work with soybean milk (p. 43-46). The executive dining room in the Engineering Laboratory. Henry Ford invited Boyer to lunch there about 6 times (p. 45). Development of soy ice cream; lipoxidase enzyme inactivation (p. 45-46).

Visits to Battle Creek, Michigan and Dr. John Harvey Kellogg (p. 47). Boyer's work was with industrial products; the plastic car and structural plastics with hemp, flax, and phenol formaldehyde (soya protein Bakelite resin) (p. 47-64, 70). Making trunk lids using a hydraulic press (p. 50). Ford's famous axe demonstration on a trunk lid (p. 50-52). Lowell Overly and Joe Stewart (p. 53-56, 61, 78-79). Boyer drives the plastic car home (p. 63). Ford's aim with the plastic car: to provide industrial markets for farmers (p. 65). World War II stops plastic car development (p. 65-66). Contract to build an airplane wing of plastic (p. 66-70). The plastic lid and car contain little or no soy (p. 70). Fiberglass and the Chevrolet Corvette (p. 71). Plexiglas and the B-24 bomber made at Willow Run (p. 72). Edsel Ford's death of stomach cancer in the spring of 1943 and its effect on his father, Henry (p. 73-74). Ending work with soy fiber (p. 74).

Boyer leaves Ford in 1943 and goes to work for Drackett Co. in Cincinnati, Ohio. Wife needs to leave Detroit. After 1943 Boyer's career really takes off. Dr. Gangloff (p. 75-77). Use of soy fiber by Drackett in felt hats. "We sold them a lot of fiber and we decided to build a bigger plant." Building a protein plant and a fiber plant in Cincinnati big enough to supply the hat company's demands and larger "than we needed just to supply our fiber operation." They also had a big operation in Cincinnati for high-impact (not structural) plastic (p. 78-80). Drackett's marketing people knew how to market Windex and Drano "but they had no feeling for the soybean operation. So when Mr. Drackett died, they sold the whole soybean plant to Archer-Daniels-Midland (ADM, p. 81-83). Before Mr. Drackett died, Boyer's division had developed commercial soy products, and Drackett was making money on the plastic (phenol formaldehyde plus hemp) and the fiber (p. 81). Use of soy protein as a paper coating (p. 83). ADM finally closes the old Drackett protein plant and sells it to Central Soya, which used the million bushel elevator capacity for storage (p. 83-84).

Shortly after Mr. Drackett died, Boyer left Drackett to work on his edible soy fiber, where he owned patents. "If we can make a fiber from soy protein that resembles the outside of a sheep, why not make a fiber that will resemble the inside (p. 84-86). Idea of building an edible soy protein plant is in Cincinnati, with Mr. Drackett's approval (p. 87). Boyer tries to find companies to license rights to his landmark patent: Virginia Carolina Chemical (Taftville, Connecticut, p. 88); Swift & Co. (p. 89-92); Unilever, which was interested in peanut protein in Africa and at Port Sunlight near Liverpool (p. 92-94, 112-13); General Foods and Nabisco (Fairmont, New Jersey research lab) (p. 94, 99). Unilever and Swift pay licensing fees of $20,000 a year plus consulting fees. General Mills and Ralston Purina (p. 94-95). Why Swift dropped its interest (p. 95-96). General Mills and Bacos (p. 96). Patent expires in 1971 after 17 years (p. 96). Worthington Foods (p. 97). Ralston Purina was getting into protein. In about 1956-58 they "had bought Procter & Gamble's protein plant in Louisville [Kentucky], which was making industrial protein for paper coating" (p.

98). Worthington Foods was too small to make their own soy protein fibers, so Ralston Purina made it for them (p. 78-80). Ralston Purina's great success with edible soy protein and their small conflict: pet food vs. human food (p. 100-01). From 1961 to 1971 Boyer was receiving licensing fees / patent royalties from Ralston Purina, Worthington, and General Mills (p. 102). General Mills and Bacos (p. 103-04). Ralston Purina's patent lawsuit against Far-Mar-Co. Ralston won $8 million. Boyer testified as an expert witness (p. 104-05).

Boyer remarries and retires in 1971 (p. 102, 105, 107). Subsequent work with Miles and Worthington; the Morningstar Farms line (p. 105-08). Companies now spinning soy protein fiber (two in the Netherlands, one in Japan, one in Australia). Ford Foundation was not interested in his work with soy protein for Third World nations (p. 110). Central Soya bought the ADM plant that was located in Chicago (p. 113-14). Kellogg's Corn Soya breakfast cereal (p. 114-15). Worthington's Soyloin Steaks; all early Kellogg and Worthington vegetarian products based on wheat gluten (p. 119). When Worthington bought Battle Creek they got their lady research director; she worked at Worthington until she was quite elderly. Boyer visited her in her lab at Battle Creek several times (p. 119-20. Note: Josephine F. Williams was in charge of the lab and product development at Battle Creek, where she worked closely with Dr. John H. Kellogg. She kept similar positions at Worthington Foods, according to Ron McDermott). Henry Ford as a soybean pioneer and visionary. The soybean is now America's No. 2 cash crop and also our second largest earner of foreign exchange. "That really started from Ford. When we first started in 1931, hardly anybody ever heard of the soybean, and Henry Ford's penchant for publicity publicized the soybean... He certainly made it popular and made people become aware of it. Today it's darned important." He should be remembered as the "Father of the Soybean." "I always thought it would be nice if they would rebuild the [Soybean] laboratory [in Greenfield Village] or restore it like it was when we were doing the soybean work and give it the real credit that it deserves..." (p. 120). After Henry Ford died in 1947 his family wanted no part of any of his pet projects. They completely eradicated the old Ford company (p. 121). Henry Ford was deeply interested in the welfare of American farmers. His tractors and Model T were of great use to them (p. 121). Origins of Ford's interest in chemurgy; William Hale and Dow Chemical Co. in Midland, Michigan; the first three chemurgic conferences in Dearborn, Michigan, in May 1935, 1936, and 1937 (p. 122-27). Ford and Ruddiman establish a complete canning line for good-tasting green soybeans on the outskirts of the Ford estate. The equipment was quite expensive. When World War II threatened, Ford gave it to Michigan State University to teach canning to students. (p. 129-30). Boyer's personal impressions of Henry Ford (p. 128-30). Address: 632 Edgewater Dr. #731, Dunedin, Florida 33528.

1048. Shurtleff, William; Aoyagi, Akiko. 1985. Tofutti & other soy ice creams: Non-dairy frozen dessert industry and market. 2 vols. Lafayette, California: Soyfoods Center. Vol. 1, 144 p. Vol. 2, 214 p. Index. Feb. 28 cm. [129 ref]
• ***Summary:*** The first study of the rapidly emerging soy ice cream market, based on historical principles. Contents: Volume I. 1. Introduction. 2. What are non-dairy frozen desserts? Standards, terminology, and labeling laws. 3. History of non-dairy frozen desserts. United States and Canada (1918–present), History of Tofu Time Inc. and Tofutti, East Asia (1936-), Europe (1946-), Third World countries (1970-), Australasia and the Middle East.

Pages 75-92, titled "The Tofutti Era and Tofutti Clones, contain histories and descriptions of four categories of non-dairy ice cream companies. Within each category, the companies are listed in the sequence that their products appeared: (1) Small soyfoods companies: Penguino's Inc. (New York), Green World (Idaho), Garden of Eatin' (California), Soy City Foods (Ontario, Canada), The Soy Shop (Georgia), Metta Tofu Co. (British Columbia, Canada), Island Spring (Washington state), Evolutionary Foods (Arizona), Midwest Tofu & Sprouts Co. (Nebraska), Cream of the Bean (Illinois). (2) Soyfoods companies that used a mixture of tofu or soymilk and soy protein isolates to make Tofutti-type products: Brightsong Light Foods (California), Farm Foods (Tennessee), White Wave (Colorado). (3) Dairy companies (or non-soyfoods companies) that launched Tofutti-style products: Presto Food Products (California), Colombo, Inc. (Massachusetts), Honey Hill Farms (California), Continental Yogurt (California), Gloria Vanderbilt / Frusen Gladje Ltd. (New York), Barricini Foods Inc. (New York), Parvelle Corp. (New York), Carvel Corp. (New York), Tuscan Dairy Farm (New Jersey), Golden Seal Riviera Ice Cream Co. (New York). (4) Innovative makers of non-dairy frozen desserts that are not soy-based: Olympus Industries (Washington, Yodolo), and Imagine Foods (Arkansas, Rice Dream).

4. The soy ice cream industry and market in the U.S. and worldwide. 5. Nutritional value of soy ice cream. 6. Directory of people, organizations, and publications connected with non-dairy frozen desserts. 7. Tofu standards and soy ice cream. 8. Technical information on soy ice cream production. Ingredients and sample ingredient listings; Formulas and processing techniques. 9. How to calculate the amount of tofu in a tofu ice cream. 10. Bibliography (129 entries). 11. Index. About The Soyfoods Center.

Volume II. Documents and Graphics Related to Soy Ice Cream. This volume contains early historical and current popular articles, product labels, posters, graphics, and corporate brochures. A rich source of information for marketing and product development, these also document the rapid growth of soy ice creams worldwide. The publication is not paginated. Contents: 12. Early history (1918-1969). 13. Farm Foods and Ice Bean (1974-). 14. Tofu Time and Tofutti (1980-). 15. Other Soy Ice Creams and General (1976-). 16. Technical information on soy ice cream production. This last section lists ingredients and recipes, and discusses regulations, labeling, production processes, and quality of soy-based frozen desserts–largely ice cream, but also popsicles, sherbets, custards, etc. Fermented or cultured soymilks are also discussed briefly.

As of Jan. 1998, both volumes are bound as one.

Note: This is the earliest document seen (Oct. 2001) that contains industry or market statistics for soy ice cream by geographical region. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

1049. Sutardi, -; Buckle, K.A. 1985. Reduction in phytic acid levels in soybeans during tempeh production, storage and frying. *J. of Food Science* 50(1):260-61, 263. Jan/Feb. [18 ref]
• ***Summary:*** Less than 10% of the phytic acid originally found in the soybeans remained after tempeh fermentation, storage for 72 hours, and deep-frying. Address: 1. Faculty of Agricultural Technology Gadjah Mada Univ., Yogyakarta, Indonesia; 1-2. School of Food Technology, Univ. of New South Wales, P.O. Box 1, Kensington, NSW 2033, Australia.

1050. Gunther, J. Kenneth. 1985. History of Gunther Products (Interview). Conducted by William Shurtleff of Soyfoods Center, March 7. 3 p. transcript. [3 ref]
• ***Summary:*** Gunther Products Inc. was founded by J. Kenneth Gunther in 1949. He received a degree in biological chemistry at the University of Illinois in 1946, then worked briefly as a researcher at Swift & Co. in Chicago. In September 1944 he was offered a job by Central Soya Co. as director of their Central Research Laboratory; there he began his first research work with soy proteins.

Before he arrived, Central Soya had done work on developing a whipping agent from soy proteins. They hired an egg albumen expert from Armour & Co. named John R. ("Ray") Turner to sell the product, but it didn't sell well because of its poor quality. Though not trained as a researcher, Turner was nevertheless technically inclined and very curious. He did some experimental work to improve the product and made several key discoveries, including the first successful use of enzyme hydrolysis of proteins with pepsin to make a whipping agent. In May and October of 1945 Turner applied for patents on his inventions; these were granted in 1949 and 1950 (U.S. Patent 2,489,208 and 2,520,581). In June 1946 Turner wrote an article in *The Manufacturing Confectioner* about "soy albumen,"which had come into demand as a result of scarcities during World War II.

At Central Soya Ken Gunther also conducted research on whipping proteins made from soy protein. There he and Louis Sair improved on Turner's original, landmark patent invention. Like Turner, they hydrolyzed the soy proteins with pepsin, but they also separated and removed much of the insoluble protein from the solubles and added a little sodium chloride, giving a more concentrated whipping agent with greater whipping strength. On 6 June 1947 Raymond S. Burnett and James K. Gunther applied for a U.S. patent on this improved process for making soy albumen. The patent (No. 2,489,173) was granted on 22 Nov. 1949–before either of Turner's patents were granted!

Whipping agents and whip toppings are very different soy-based products. The whip toppings, such as Delsoy or Rich's Whip Topping, had a high fat and moisture content (about 35% fat, 55% water, and 10% sugar), and were used in place of whipping cream; they used a small amount of sodium proteinate that was not enzyme modified. Whipping agents or "soy albumen" type products, by contrast contained no fat, were modified (hydrolyzed) with enzymes, and were used in place of egg whites.

In the late 1940s Central Soya's founder, D.W. McMillen, forecast a huge depression. In early 1949 he fired most of his research staff, including Gunther. The outbreak of the Korean War in mid-1950 revived the U.S. economy so that McMillen's predicted depression was aborted.

In the summer of 1949 Ken Gunther founded Gunther Products in his home town of Galesburg, Illinois, where his family still lived and owned property. He purchased an exclusive license from Central Soya to manufacture enzyme-modified non-fat isolates under their patent. He paid license fees of 4% on sales for the next 14 years. Gunther Products bought food-grade soybean flakes (containing about 50% protein, also used in making soy flour) from A.E. Staley Mfg. Co. and from ADM. The main uses of Gunther's whipping proteins were in confectionery products, especially nougat-like or marshmallow-like nougat candies. The maker of Mars Candy Bars was one big customer. Most of the rest was used in icings and as an ingredient in a sponge cake mix (which sold very well in Australia). Lever Brothers was interested in Gunther's products for 2-3 years.

In 1969 Gunther Products was sold to the A.E. Staley Manufacturing Co. Ken Gunther, who was 62 years old at the time, needed $750,000 to expand his plants to meet demand and Staley was very interested in getting into this kind of soy protein business. Before that time Staley had done almost no research on soy protein foods in their huge laboratories–except for a little work on soy flour during World War II. Ken stayed on to run the business (which continued to be very successful), retiring in about 1973.

Address: Gunther Products, 701 W. 6th St., Galesburg, Illinois 61401. Phone: 309-342-0119.

1051. Australian Department of Immigration and Ethnic Affairs. 1985. A land of immigrants. Australia. 16 p. 28 cm. • ***Summary:*** Human beings first set foot on the Australian landmass at least 40,000 years ago. Probably originating in Southeast Asia, they were the ancestors of today's Australian Aborigines.

European discovery: The first European visitors to Australia were the Dutch, who explored the Gulf of Carpentaria in 1606 and landed in 1642. In 1642 the Dutchman Abel Tasman discovered Tasmania. In 1688 the English buccaneer, William Dampier, in a stolen vessel, the Cygnet, visited Australia's northwest coast. In 1699 he returned in command of the Royal Navy Ship, Roebuck, to continue his exploration of New Holland, the name the Dutch had given the continent after Tasman's voyages. In 1770 navigator James Cook claimed the eastern part of Australia for Britain; he discovered Botany Bay and named the land New South Wales; it did not come to be called Australia until the 19th century.

A colony is born: "Loss of her North American colonies following the Declaration of Independence on 1776 prompted Britain to seek a new land suitable for penal settlement... Before the revolt of the American colonists (1775-83), Britain had been transporting about 1,000 convicts a year, mainly to Virginia and Maryland. Between 1717 and the War of Independence (1775-83), at least 50,000 English convicts were shipped to America. In 1779 Sir Joseph Banks, a botanist with Capt. Cook, first suggested the establishment of British penal colony at Botany Bay, New Holland (Australia). In 1783 an American suggested that American colonists loyal to Britain be resettled in New Holland; actually, most moved to Canada. On 26 Jan. 1788 the first group of 736 British convicts plus several hundred non-convicts arrived at Sydney Cove, Port Jackson, New South Wales, and Governor Phillip founded the settlement at Sydney Cove–a date that is still celebrated each year as "Australia Day" (prior to 1932 called "Foundation Day"). The first party of free immigrants arrived in 1793. The country was first named Australia in 1817 and the entire continent was claimed by Britain in 1829. By the late 18th century, when the first European settlers arrived, an estimated 250,000 to 300,000 Aborigines were living in Australia. Shipping of convicts to eastern Australia was abolished in 1840, but it continued until 1853 in Tasmania and until 1868 in Western Australia. By that time, some 160,000 of them had been sent to Australia.

The Australian Gold Rush: The discovery of gold at Bathurst, about 100 miles northwest of Sydney, New South Wales, in 1851 (3 years after it was discovered in California), and later at Ballarat and Bendigo, north of Melbourne, Victoria, brought a flood of fortune seekers from around the world–including China. The Chinese population on the goldfields increased rapidly, reaching 17,000 by 1855, at which time an act to restrict Chinese entry was passed, thus beginning the policy of "White Australia." In the gold rush decade, more than 600,000 immigrants arrived. [Note that the early gold fields were located in southwest Australia, the same area where soybeans were most widely grown after 1980.] From 1850 to 1860, Australia's non-Aboriginal population grew from 405,356 to 1,145,585. In 1861 there were 40,000 Chinese in Australia. Japanese began to arrive in the late 1800s.

In the second half of the 19th century, gold mining led to the establishment of many coastal and inland centres in Queensland (in northeastern Australia; separated from New South Wales in 1859). Gold drew thousands of miners to fields such as Gympie, Charters Towers and the Palmer River valley; the Mount Morgan mine was established in 1882. Gold also brought people to Western Australia, where the famous goldfields, Coolgardie and Kalgoorlie, were discovered in the second gold rush of 1892-1983. In 10 years Western Australia's population rose from 93,000 (in 1886) to 138,000 (in 1896). From 1851 to 1891, some 1,390,000 were attracted to Australia by the discovery of gold and the subsequent rapid development of agriculture. The 1891 population of 3,174,400 included 46,600 from Asia.

White Australia: In 1901 the Commonwealth of Australia was established, with Canberra as its capital. The Commonwealth Government passed a policy restricting Asian immigration in general. In 1901 Australia's population was 3,773,801–not including Aborigines whose numbers had fallen to about 95,000. Some 77% of the population were born in Australia and 18% in Britain. Roughly 32,000 were Chinese and 3,593 were Japanese-born. This so-called "White Australia" policy that began officially in 1901 prevented the immigration of non-Europeans from more than 50 years. "In 1901 Japanese-born residents of Australia totalled 3,593 but as a result of the Immigration Restriction Act of that year, their numbers declined. During World War II, most returned to Japan or were interned. By 1981, with a non-discriminatory immigration policy, Japanese-born residents of Australia had increased to 8,060.

On 26 Jan. 1949 ("Australia Day") it first became possible for a person to become a citizen of Australia, as the Australian Citizenship Act went into effect. Before that, the nationality status for Australians was simply "British subject."

Starting in the late 1940s, the "White Australia" policy was gradually and increasingly relaxed; it was finally abolished in 1973. Since World War II, immigration has included more than 400,000 refugees. The largest single group has been the 88,112 Indo-Chinese (including 68,000 Vietnamese, many of them "boat people") who arrived between April 1975 [when the USA was defeated in Vietnam] and June 1984. As of 1981, 9.3% of Australia's overseas-born residents had been born in Asia.

Note: These Asians must have brought soybeans and soyfoods to Australia before 1900, but we have yet to see anything published documenting this pioneering work. Indeed, no one knows when and how soybeans first arrived in Australia. Address: Australia.

1052. Buchanan, Alex. 1985. Prof. Amara Bhumiratana (1919-1984). *ASEAN Food Journal (Malaysia)* 1(1):2. March.
• ***Summary:*** Prof. Bhumiratana died on 12 Dec. 1984. "His position as a foundation member of the Editorial Board of this ASEAN Food Journal reflected his very high standing in the ASEAN community of food technologists. It was his leadership as Chairman which firmly established the ASEAN Sub-Committee on Protein as an effective vehicle of regional co-operation, thus making it the first effective regional R and D project among the ASEAN countries. This provided the background and experience on which ASEAN and Australia were able to launch the ASEAN Food Waste Materials Project and later the ASEAN Food Technology Research and Development Project. Both these initiatives were first put forward by Professor Amara... Yet his main contributions to the development of food science and technology were undoubtedly in Thailand. The Institute of Food Research and Development in Bangkok was created and built to its present size entirely under his leadership." Address: Australian High Commission, Kuala Lumpur, Malaysia.

1053. **Product Name:** Garlic Tempeh.
Manufacturer's Name: Nectar Tempeh. Later? changed to Nectar Soy Products.
Manufacturer's Address: 4/13 Glamis St. (P.O. Box 969), Geelong, VIC, 3220, Australia. Phone: 05-221-4458.
Date of Introduction: 1985. March.
New Product–Documentation: Letter (fax) from Ross Hamilton and Mike Manser. 1990. Sept. 13. This was the company's second product, introduced in March 1985.

1054. **Product Name:** Tofu.
Manufacturer's Name: Pureland Soy Products.
Manufacturer's Address: P.O. Box 56, Eudlo, QLD 4554, Australia. Phone: 071-45-0370.
Date of Introduction: 1985. May.
New Product–Documentation: Letter from Riccio A. Ferrari. 1988. March 14. They started making tofu "a couple of years ago." They now make 1,800 lb/week using all second-hand equipment. Talk with (call from) Ricciardo Ferrari of Pureland. He makes only tofu; started about 4½ years ago in May 1985. Wants to expand the business.

Letter from R.A. Ferrari of Pureland Soy Products. 7 May 1992. The company address is now 23 Depot St., Maroochydore, QLD 4558. Phone: (074) 43 4254.

Letter and leaflet sent by Jennie Finnigan and Ricciardo Ferrari. 1992. June 17. The company now has a new address and phone number: Lot 47 Page Street, Kunda Park, QLD 4556. Phone: (074) 45 6077. The leaflet (brown on yellow) states that Pureland's fresh tofu is now available in 375 gm, 500 gm, and 750 gm packs.

1055. Shurtleff, William; Aoyagi, Akiko. 1985. History of tempeh: A fermented soyfood from Indonesia. 2nd ed. Lafayette, California: Soyfoods Center. 91 p. May. 28 cm. [402 ref]
• ***Summary:*** A slightly revised and updated version of the July 1984 edition. Address: Soyfoods Center, P.O. Box 234, Lafayette, California 94549.

1056. Sutardi, -; Buckle, K.A. 1985. Phytic acid changes in soybeans fermented by traditional inoculum and six strains of *Rhizopus oligosporus*. *J. of Applied Bacteriology* 58(6):539-43. June. [12 ref]
• ***Summary:*** "Tempeh was prepared from Delmar variety soybeans inoculated with the traditional Indonesian inoculum *(usar)* and 6 pure culture strains of *Rhizopus oligosporus*. The strains BTU3K1 and CT11K2 produced the best quality tempeh. The phytic acid content of soybeans was reduced from 1.07% in whole dry soybeans to 0.67-0.75% in tempeh. Most mould strains did not have a significantly different effect on reducing the phytic acid content in tempeh." Address: School of Food Technology, The Univ. of New South Wales, P.O. Box 1, Kensington, NSW 2033, Australia.

1057. **Product Name:** Tofu.
Manufacturer's Name: Chenrezig Institute.
Manufacturer's Address: Eudlo P.O., QLD 4554, Australia.
Date of Introduction: 1985. July.
New Product–Documentation: Letter from Mark Gerhard of Chenrezig. 1985. July 23. "A group of us here in the hills of Queensland have just started making our own tofu (using your *Book of Tofu* as a guide) and it has proved very successful. We are swamped with orders from all the local health food shops."

Mark has also been interested in miso for the last three years. "Have just purchased your *Book of Miso* and am deeply impressed by it... You have given me the enthusiasm to seriously think about making our own miso and other related soy products, starting from growing our own beans." He enquires about ordering a copy of *Miso Production*.

"Please keep up the good work. Your far-sighted vision of overcoming (or at least helping) world hunger is highly commendable and very inspiring. May all your wishes be spontaneously fulfilled."

1058. Brin, Herb. 1985. Grandma power and Rebbe are his recipe. Mintz's Tofutti is newest taste sensation. *Heritage (Los Angeles).* Aug. 30.

• ***Summary:*** Mintz is a devoted follower of the Lubavitcher Rebbe, who once advised him: "Drop the food business and concentrate on tofu desserts. You will be successful." Tofutti is now found in 36,000 supermarkets across America in 48 states. It is being sold in Hong Kong, Australia, and many parts of Europe.

Note: Rabbi Shneur Zalman of Liady (1748-1812) was a mystic who founded the Lubavitch sect. Address: Los Angeles, California.

1059. **Product Name:** Lightly Steamed Soy Flour (For Commercial Applications Only).

Manufacturer's Name: Soy Products of Australia Pty. Ltd.

Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: 729-1738.

Date of Introduction: 1985. September.

Ingredients: Soybeans.

New Product–Documentation: Talk with Paul Smith of Soy Products of Australia Pty. Ltd. 1995. Feb. 20.

1060. Doyle, M.J.; Brown, A.H.D. 1985. Numerical analysis of isozyme variation in *Glycine tomentella. Biochemical Systematics and Ecology* 13(4):413-19. Oct. [12 ref]

• ***Summary:*** Isozyme variation among 114 accessions of *Glycine tomentella* were analysed. These came from seven regions: New South Wales, southern and central Queensland, Cumberland and Whitsunday Islands, northern Queensland, Northern Territory and Kimberley Ranges, Western Australia, Papua New Guinea, and South East Asia.

The diploid accessions fell into six distinct groups which conformed with differences in chromosome number ($2n = 38$ or $2n = 40$) or in geographic origin. The majority of the tetraploid accession belonged to a large, geographically dispersed group, predominantly aneuploid ($2n = 78$) group. The remaining four tetraploid groups were distinct on the basis of morphology or geographic distribution.

The subgenus *Glycine* currently consists of seven perennial species and represents a major potential source of germplasm for soybean improvement. Address: 1. Dep. of Agricultural Genetics and Biometry, Univ. of Sydney, Sydney, NSW, Australia; 2. CSIRO, Div. of Plant Industry, Canberra, ACT, Australia.

1061. Anderson, Ronald L. 1985. Re: History of Continental Grain Company's involvement with soybeans. Letter to William Shurtleff at Soyfoods Center, Nov. 11. 10 p. Typed, with signature on letterhead.

• ***Summary:*** The following is excerpted from a 1985 Continental Grain Strategic Planning Study: History–World Processing Division: 1946–Allied Mills–Bought Taylorville, Illinois soybean crushing plant (100 tonnes/day capacity). Note: Allied Mills owned a soybean crushing plant at Taylorville, Alabama, by Aug. 1935.

1960–Allied Mills–Guntersville, Alabama, crushing plant start-up (500 TPD).

1965–Continental acquires 51% of Allied Mills, a major feed producer [Wayne Feeds] as well as a producer of fresh poultry.

1973–Acquired Allied Mills' plant in Cameron, South Carolina (300 TPD) and expanded it to 800 TPD.

1974–Allied Mills becomes a wholly owned subsidiary of Continental Grain. Continental's new Processing Division is created by consolidating the above three soybean plants from Allied Mills. That year Continental expanded its charter to include participation in international processing and oilseed product trading. Thus the company first expanded outside the USA. 1975–Acquired a specialty plant in Culbertson, Montana, to crush safflower and sunflower seeds (no soy; Expanded to 400 TPD in 1983). 1975-77–Constructed a soybean crushing plant at Liverpool (1,500 TPD; expanded to 2,200 TPD in 1982).

1976–Acquired a soybean and cottonseed crushing and oil refining plant at Capsa, Paraguay (600 TPD). 1977-79–Constructed a soybean crushing plant at Maringa, Brazil (2,200 TPD). 1979–Rebuilt a plant in Maurie, Australia, with a toll crush agreement with the Australian government, to crush soybeans, sunflower, und safflower seeds (300 TPD).

1980-81–Built a plant to crush sunflower and soybeans at Chivilcoy, Argentina (800 TPD). 1981–Acquired 50% of ICIC plant at Ancona, Italy. It crushes 800 TPD of soybeans and 250 TPD of sunflower seeds, and also refines oil. 1983–Bought plant in Sydney, Australia (300 TPD).

1984–Sold plant at Taylorville, Illinois. 1985–Acquired soybean crushing plant at Venice, Italy (1,200 TPD). 1986–Sold Liverpool plant (2,000 TPD). 1987–Sold Cameron plant (1,000 TPD). 1987–Closed Oleaginosa tung nut plant in Argentina. 1988–Sold Culbertson plant (400 TPD). 1989–Plant to sell all South America and Australia plants and upgrade Italian plants. 1989–Formed joint venture marketing company [Conti-Quincy] with Quincy Soybean of Quincy, Illinois.

In 1975 Continental's oilseed crushing capacity was 3,000 TPD or 1,100,000 tonnes/year. By 1985 this had increased roughly four-fold to 11,800 TPD or 4,300,000 tonnes/year.

A table lists all U.S. soybean crushers, the city and state of each of their plants, and the capacity of each. There were 78 plants with a total capacity of 121,025 TPD

America's largest soybean crushers are ADM (18 plants, 32,900 TPD, 27.3% market share), Cargill (21 plants, 29,200 TPD, 24.2%), Bunge (8 plants, 14,600 TPD, 12.1%), Central Soya (8 plants, 12,000 TPD, 9.9%), Ag Processing (6 plants, 10,050 TPD, 8.3%), Quincy Soybean Co. (3 plants in Illinois and Arkansas, 5,700 TPD, 4.7%), and Others (12 plants, 16,270 TPD, 13.5%). Address: Senior Vice President and General Manager, Continental Grain Co., World Processing Div., 277 Park Ave., New York, NY 10172. Phone: 212-207-5100.

1062. Jackson, Vicki. 1985. Squirrels vegetarian cook book no. 2. Oneness Life Press, Elizabeth St., Brisbane, Queensland, Australia. 156 p. Illust. by Vicki Jackson. Index. Nov. 29 cm.
• ***Summary:*** This hand-lettered cookbook was written for Squirrels Restaurant, 190 Melbourne St., West End (Brisbane) 4141, which has been open for more than 3 years. The first vegetarian cookbook from this restaurant was published in Nov. 1983.

Soy-related recipes include: Miso & green vegetable soup (p. 8). Tempeh & beanshoot (p. 42). Lemongrass and tofu curry (p. 87). Tempeh kebabs (p. 94). Tempeh burgundy (p. 95). Tempeh & coconut sauce (p. 96). About tofu (p. 97-98). Tofu & Spinach pie (p. 98). Tofu teriyaki & fried rice (p. 99). Tofu à la king (p. 100). Tofu stroganoff (p. 101). Tofu chow mein (p. 102). Tofu nuggets in chick pea batter (p. 103). Curried tofu loaf (p. 104). Pages 149-50 describe tamari, tempeh, tofu, and miso. Address: Brisbane, Queensland, Australia.

1063. Larcher, Jacques. 1985. Effets d'une récolte retardée sur le rendement et la qualité des semences de soja *(Glycine max* (L.) Merrill) au Sénégal [Effect of a late harvest on yield and quality of soybean seed in Senegal]. *Agronomie Tropicale (France)* 40(4):337-41. Nov/Dec. [16 ref. Fre; eng; spa]
• ***Summary:*** Soybeans of the variety IRAT 273 (ISRA-IRAT 44A/73) were grown at Sefa, Senegal, in 1982. Losses due to natural dehiscence of pods, to harvest handling and mechanical threshing were about 30-40% for a harvest made 20 days after stage R8; they reached 50% 25 days after stage R8. Address: Mission IRAT, Papeete, French Polynesia.

1064. Singh, R.J.; Hymowitz, T. 1985. Diploid-like meiotic behavior in synthesized amphiploids of the genus *Glycine* Willd. subgenus *Glycine. Canadian J. of Genetics and Cytology* 27(6):655-60. Dec. [20 ref]
Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1065. **Product Name:** Jay and Lisa Sommers Tofu and Tempeh?
Manufacturer's Name: Unknown.
Manufacturer's Address: Latrobe, Tasmania.
Date of Introduction: 1985-1988.
New Product–Documentation: Talk with Trishala Shub. 1998. Jan. 18. As far as she knows, the first people to make tofu commercially in Tasmania were Jay and Lisa Sommers. They started in about 1985-88 in a small factory in Latrobe, near Bernie, is Tasmania. They also made tempeh. Trishala is still in touch with Jay and Lisa, who still live in Tasmania; she will ask them if they will write the story of how they founded Tasmania's earliest known tofu and tempeh manufacturing company. The Sommers later sold their equipment to a church group, which some years later sold it to Trishala and her former husband. She sold the equipment in June 1997 to the people from Organic Choice.

1066. **Product Name:** Bean Supreme Soysage (Vegetarian Okara-Based Sausage).
Manufacturer's Name: Bean Supreme Soyfoods.
Manufacturer's Address: P.O. Box 78084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1985.
Wt/Vol., Packaging, Price: 300 gm.
How Stored: Refrigerated.
New Product–Documentation: Poster. 1986. Form filled out by Trevor Johnston, Marketing Director. 1989. April. This product was introduced in 1985. They now make 1,500 kg/month.

1067. Beech, D.F.; Garside, A.L.; Wood, I.M. 1985. Phenology, plant and seed characteristics of a collection of soybeans (Glycine max) grown during the wet season in tropical Australia. St. Lucia, Qld., Australia: CSIRO Division of Tropical Crops and Pastures. 11 p. Genetic resources communication No. 8. 30 cm. [10+ ref]*
Address: Ord River, Western Australia.

1068. FAO RAPA. 1985. Agriculture in Asia–Pacific Region: A pictorial profile. *RAPA Monograph (Bangkok, Thailand)* 1985/8. *
• ***Summary:*** RAPA stands for "Regional Office for Asia and the Pacific."

1069. Giles, David E.A.; Goss, Barry A.; Chin, Olive P.L. 1985. Intertemporal allocation in the corn and soybean markets with rational expectations. *Working Paper, Dept. of Econometrics and Operations Research, Monash Univ.* No. 12/85. 32 p. Also published as Dept. of Economics Seminar Papers No. 9/85. 34 p. 30 cm. [30+ ref]*
Address: Monash Univ. Dep. of Economics.

1070. Heap, M.A.; Kirke, A.B. 1985. Insect scouting in Ord Valley soybeans: 1984-85 wet season. Kununurra, W.A.:

Australian Dept. of Agriculture, Kununurra Region. 19 p. With plates, some color. 30 cm. Spiral bound. [10+ ref]* Address: Kununurra, Western Australia.

1071. Houghton, D.A.; Pearce, P.A. 1985. Zero-till soybean production in pastures. Brisbane, Australia: Queensland Dept. of Promary Industries. 12 p. Illust. 30 cm. * Address: Queensland, Australia.

1072. **Product Name:** Gomasio Tempeh Chips (Gomashio is Sesame Salt).
Manufacturer's Name: Light Wave Wholefood.
Manufacturer's Address: 21 Gilbert St., Newton, Adeliade, South Australia.
Date of Introduction: 1985.
Ingredients: Tempeh, gomasio [gomashio], olive oil.
Wt/Vol., Packaging, Price: 50 gm.
How Stored: Shelf stable.
New Product–Documentation: Label. 1985, undated. 4.5 by 5 inches. Black on yellow.

1073. **Product Name:** Pre-seasoned Tempeh.
Manufacturer's Name: Light Wave Wholefood.
Manufacturer's Address: 21 Gilbert St., Newton, Adeliade, South Australia.
Date of Introduction: 1985.
Ingredients: Soybeans, herbs, spices, tempeh starter.
Wt/Vol., Packaging, Price: 250 gm.
How Stored: Refrigerated.
New Product–Documentation: Label. 1985, undated. 4.5 by 5 inches. Black on green.

1074. **Product Name:** Rice & Soy Tempeh.
Manufacturer's Name: Light Wave Wholefood.
Manufacturer's Address: 21 Gilbert St., Newton, Adeliade, South Australia.
Date of Introduction: 1985.
New Product–Documentation: Label. 1985, undated. 4.5 by 5 inches. Black on blue.

1075. **Product Name:** Sweet & Sour Tempeh Lumpia (Vegetarian Spring Roll).
Manufacturer's Name: Light Wave Wholefood.
Manufacturer's Address: 21 Gilbert St., Newton, Adeliade, South Australia.
Date of Introduction: 1985.
Ingredients: Pan-steamed tempeh, onions, lotus root, cabbage, soya and/or mung sprouts, carrot, tamari, miso, tamarind, maple syrup.
New Product–Documentation: Label. 1985, undated. 2 by 5.5 inches. Dark blue on light blue. "No eggs, synthetic additives or any animals and not deep fried."

1076. **Product Name:** Margaret's Tempeh.
Manufacturer's Name: Margaret's Tempeh.
Manufacturer's Address: P.O. Margaret River, W.A., Australia.
Date of Introduction: 1985.
New Product–Documentation: Label. 1985, undated. 4 inches square. Black and green on white. 250 gm.

1077. Brown, A.H.D.; Grant, J.E.; Burdon, J.J.; Grace, J.P.; Pullen, R. 1985. Collection and utilization of wild perennial *Glycine*. In: R. Shibles, ed. 1985. World Soybean Research Conference III: Proceedings. Boulder, Colorado: Westview Press. xxiii + 1262 p. See p. 345-52. [14 ref]
• ***Summary:*** Contents: The wild perennial *Glycine* species. Hybridization between soybean and perennial *Glycine*. A new potentially "bridging" species: *G. argyrea*. Wild contributions to soybean improvement. Future prospects. References. Address: CSIRO, Div. of Plant Industry, Canberra, A.C.T. 2601, Australia.

1078. Carter, O.G. 1985. Breeding soybeans for special uses. In: R. Shibles, ed. 1985. World Soybean Research Conference III: Proceedings. Boulder, Colorado: Westview Press. xxiii + 1262 p. See p. 374-79. [27 ref]
• ***Summary:*** Contents: Oil quality. Protein: Tofu, soymilk. Oligosaccharides. Cookability. Anti-nutritional factors. Conclusions. Address: Asst. Principal, Hawkesbury Agricultural College, Richmond, New South Wales, 2753, Australia.

1079. Doyle, J.J.; Beachy, R.N. 1985. Ribosomal gene variation in soybean *(Glycine)* and its relatives. *Theoretical and Applied Genetics* 70(4):369-76. [26 ref]
• ***Summary:*** Studies of nuclearly-encoded 18S-25S ribosomal multigene family in both subgenera of *Glycine* showed that while considerable variation for repeat length and spacer sequence occurs within the subgenus *Glycine*, *Glycine max* and *G. soja* appear to be identical to one another. Address: 1. L.H. Bailey Horotorium, Cornell Univ., Ithaca, New York 14853, USA; 2. Dep. of Biology, Washington Univ., St. Louis, Missouri 63130, USA.

1080. Hume, D.J.; Shanmugasundaram, S.; Beversdorf, W.D. 1985. Soyabean *(Glycine max* (L.) Merrill). In: R.J. Summerfield and E.H. Roberts, eds. 1985. Grain Legume Crops. London: Collins. xvi + 859 p. See p. 391-432. Illust. Index. 24 cm. [192 ref]
• ***Summary:*** Contents: Introduction: History, current status and future projections. Principal economic yield and uses of crop products. Principal farming systems. Botanical and agronomic features: Symbiotic nitrogen fixation potential. Principal limitations to production and yield: Developing countries, developed countries. Fertiliser requirements. Quality of seed constituents. Germplasm resources. Principal breeding strategies: Adaptation to new geographic

areas, breeding methodology, breeding objectives, seed quality, pest and disease tolerances, current trends in soyabean breeding. Avenues of communication among researchers (INTSOY, AVDRC, IITA, FAO). Prospects for larger and more stable yields.

Tables: (1) Area (1000 ha), yield (kg per ha), and production (1000 tonnes) of soyabeans from 1969-71 to 1982. (2) Maturity durations and productivity potentials of soyabeans in selected countries. (3) *Glycine* species collections around the world. (4) Sources of resistance among soyabeans to selected insect pests. (5) Sources of resistance among soyabeans to selected diseases.

Table 9 shows that there are soybean germplasm collections in 15 countries. This table has 4 columns: Country, location (city), curator, and no of accessions. AVRDC in Taiwan has the largest germplasm collection in one location (10,400 accessions, Tainan), followed by USA (9,648, Illinois and Mississippi), India (4,000, Pantnagar; 1,800 Amravati), Japan (3,541, Tsukuba; 200, Morioka), USSR (3,000, Leningrad), China (3,000 Jilin; 3,000 Hubei; 2,930 Shadong [sic, Shandong {W.-G. Shantung}]; 2,500 Beijing; 960 Heilungjiang [Heilongjiang]). Also: Australia 400, France 500, Nigeria 1,300, Indonesia 600, South Korea 2,833, North Korea 300, South Africa 600, Sweden 1,200, and Thailand 1,686. Address: 1&3. Univ. of Guelph, Dep. of Crop Science, Guelph, Ontario N1G 2W1, Canada; 2. Asian Vegetable Research and Development Centre (AVRDC), PO Box 42, Shanhua, Tainan 741, Taiwan, Republic of China;.

1081. Juvik, Gail A.; Bernard, R.L.; Kauffman, H.E. 1985. Directory of germplasm collections. 1. II. Food legumes (Soyabean). Rome, Italy: International Board for Plant Genetic Resources. 53 p. Co-sponsored by INTSOY. [11 ref]

• ***Summary:*** Soybean germplasm collections worldwide are listed (with address and number of accessions) in the following countries: Argentina, Australia, Austria, Bangladesh, Bolivia, Brazil (2 collections), Bulgaria, Canada, China (14 collections), Taiwan (3), Colombia, Czechoslovakia (2), France (4), Germany (East), Germany (West), Greece, Hungary (2), India (8), Indonesia (3), Italy, Japan (5), Korea (South, 2), Malaysia, Nepal, Nigeria, Papua New Guinea, Paraguay, Philippines, Poland, Portugal, Romania, Spain, Sri Lanka, Thailand (2), Turkey, USSR, United Kingdom, USA (5), Uruguay, Venezuela, Vietnam (2), Yugoslavia, Zambia, Zimbabwe.

The world's largest soybean germplasm collections are as follows: AVRDC, Tainan, Taiwan (12,200 accessions), National Seed Storage Laboratory (NSSL), Fort Collins, Colorado, USA (10,880), Univ. of Illinois, Urbana, IL, USA (8,368), Jilin Academy of Agricultural Sciences, Jilin, China (4,800), N.I. Vavilov All-Union Institute of Plant Industry (VIR), Leningrad, Moscow (4,700), All-India Coordinated Research Project on Soybean, G.B. Pant Univ. of Agriculture and Technology, Pantnagar, India (4,022), Suweon, South Korea (4,020), Tsukuba, Japan (3,741), USDA, Stoneville, Mississippi, USA (3,000).

A world map (p. 9-10) shows (1) The sites of all soybean germplasm collections, (2) the range of ancient cultivation of the soyabean (East and Southeast Asia), (3) range of the wild soybean (Glycine soja; in China and Japan), and (4) range of perennial Glycine (Australia, Papua New Guinea, Philippines, Taiwan, Melanesia, and Micronesia).

This document is "Available free to developing countries, but restricted distribution to developed countries." Address: 1&3. INTSOY, Univ. of Illinois at Urbana-Champaign; 2. USDA-ARS, Dep. of Agronomy.

1082. Lawn, R.J. 1985. Eastern sub-tropics and tropics. In: J.J. Basinski, I.M. Wood, and J.B. Hacker, eds. 1985. The Northern Challenge: A History of CSIRO Crop Research in Northern Australia. Australia: CSIRO. See p. 147-71. Chap. 7. Research Report No. 3: CSIRO Div. of Tropical Crops and Pastures. [66 ref]

• ***Summary:*** Section "7.5 The oilseeds program" states (p. 152): Difficulties of securing imports of vegetable oils from traditional sources during the war [World War II] highlighted the strategic value of Australia developing its own oilseeds industries, and greater research effort was placed on the introduction program in southern Queensland during the period 1944-51. Most attention was focused on soybean, with moves to establish a local industry sponsored by the Commonwealth Department of Commerce and Agriculture. Added impetus was provided by the report of a mission to the U.S.A. which recommended an expansion of the soybean research effort in Australia (Bulcock et al. 1947)... The work was directed by Mr. S.G. Gray of the Division of Plant Industry, based initially at Canberra and later at Lawes.

"Like much of the earlier crop introduction work, the oilseeds program consisted largely of trials of introduced material,... but included some important advances in approach... Comparison of climatic data, for example, enabled Gray to identify, with what in retrospect was remarkable perception, the inland irrigation areas of the Murray system, the coastal and subcoastal regions of New South Wales and Queensland north to Gayndah, and parts of the Northern Territory and tropical Western Australia, as potential soybean producing areas. Further, he even suggested the possibility of autumn and winter crops in the northern coastal regions of Queensland." "In 1951, Gray was transferred to pasture work and the oilseeds program terminated" (p. 153).

In 1958 Mr. Don E. Byth became the "first scientist appointed by CSIRO to undertake breeding work on Grain legumes in northern Australia. His pioneering work with soybeans played a large role in the development of the Australian soybean industry." A photo shows Byth (p. 155).

Section "7.9 Soybean breeding" begins (p. 156-57): The soybean breeding program lasted from 1959-1967 and was primarily the responsibility of Dr. D.E. Byth, apart from the period 1962-65 when Byth was on study leave in the U.S.A. and Dr. A.J. Pritchard was caretaker of the program." Unfortunately the soybean breeding program took place in the context of pasture-dominated research. Emphasis was placed on protein rather than oil and adaptation to drier areas. In 1967 Byth accepted an appointment at the University of Queensland, "continuing his breeding work on soybean, but changing the objectives to place greater emphasis on production of soybeans as an oilseed crop as well as a source of protein, and with less emphasis on the marginal rainfall areas."

"In Dec. 1972, Mr. R.J. ["Bob"] Lawn, then a student at the University of Minnesota, was appointed as crop physiologist / agronomist at Cunningham Laboratory, and the Division of Tropical Pastures' involvement with protein grains [and soybeans] was reestablished" (p. 158).

A map (p. 129) shows the "Locations of the regional research centres and experimental sites used by CSIRO in its research on crops in southern and eastern Queensland 1926-1984." Key locations include Fitzroy Vale, Brisbane, and Lawes. Address: CSIRO Div. of Tropical Crops and Pastures, The Cunningham Lab., 306 Carmody Road, St. Lucia, Queensland, Australia.

1083. Shurtleff, William; Aoyagi, Akiko. 1985. When major soybean producing nations reached "takeoff" of 10,000 metric tons (Document part). In: Shurtleff and Aoyagi. 1985. Soyfoods Industry and Market: Directory and Databook. 5th ed. Lafayette, CA: Soyfoods Center. 202 p. See p. 168.

• ***Summary:*** Pre-1850 China proper, Manchuria, Korea, Japan, Taiwan, Indonesia. 1912 United States. 1925 USSR. 1942 Canada. 1946 Brazil, Thailand. 1955 Nigeria. 1956 Colombia. 1958 Vietnam (North and South combined). 1959 Yugoslavia. 1961 Argentina. 1962 Mexico. 1963 Paraguay. 1966 Romania. 1968 India. 1969 Turkey. 1971 Bulgaria. 1972 Iran, Nepal, Australia. 1974 South Africa, Hungary, Burma. 1975 Uruguay, Bolivia, Zimbabwe. 1976 Egypt. 1979 France. 1980 Philippines. Address: Lafayette, California. Phone: 415-283-2991.

1084. *SoyaScan Notes.* 1985. Chronology of Lea & Perrins Worcestershire Sauce. 13 May 1994. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** This chronology is a revised and expanded version of one published in an unknown UK airline magazine, found in one of the Lea & Perrins historical scrapbooks (Fair Lawn, New Jersey). We offer no guarantee of its accuracy.

1823 Jan. 1–Mr. William Perrins and Mr. John Wheeley Lea form a partnership to carry on the chemists and druggists business at 68 Broad Street, Worcester, England (located about 25 miles southwest of Birmingham). 1835–Lord Sandys, the former governor general of Bengal, gives recipe to Mr. Lea and Mr. Perrins in Worcester, England.

1837–Lea & Perrins sauce first sold commercially.

1842–636 bottles sold.

1845–Factory set up in Bank Street, Worcester.

1849–Arrangements made for exports to New York. The exclusive U.S. agent was John Duncan & Sons, a small firm which imported liquors and wines from Europe, and preserves, jams, and jellies from England.

1852–Annual sales reach 30,000 bottles.

1853–Lea & Perrins Worcestershire Sauce is awarded a medal at the New York Exhibition of the Industry of All Nations.

1897–New (present) factory built in the Midland Road, Worcester.

1902–Bottling begins in New York.

1906–The High Court of Justice in Britain decrees that no firm other Lea & Perrins be allowed to call their Worcestershire Sauce "the Original" or "the Genuine." This helps deals with upstarts and imitations.

1910–U.S. Bottlers (Duncans) move to West Street. Lea & Perrins (Inc.) of America.

1930–Lea & Perrins U.K. merge with H.P. Sauce Limited. John Duncan's Sons becomes Lea & Perrins Inc.

1931–Worcestershire Sauce manufacture begins in Australia.

1931–Lea & Perrins Inc. is incorporated into H.P. Sauce Ltd.

1940–Bottling of Lea & Perrins moves to Tower Road, Birmingham, during World War II.

1946. manufacture begins again in Worcester.

1967–H.P. Sauce / Lea & Perrins acquired by Imperial Tobacco Co.

1985–Imperial Tobacco increases its control to 100%. Lea & Perrins International formed representing Lea & Perrins, H.P. Foods and Golden Wonder abroad.

1986 April–Hanson Trust assumes control of Imperial Foods / Lea & Perrins.

1988–Lea & Perrins is acquired by BSN Groupe of Paris, France.

Note: 1994 July–BSN Groupe changed that name to Groupe Danone.

Today, in addition to its Original Worcestershire, Lea & Perrins produces Lea & Perrins Steak Sauce, Lea & Perrins White Wine Sauce (for chicken, fish, or lighter foods), and Lea & Perrins Barbecue Sauce.

1085. Summerfield, R.J.; Roberts, E.H. 1985. Grain legume species of significant importance in world agriculture: *Glycine max*. In: Abraham H. Halevy, ed. 1985. CRC

Handbook of Flowering. Vol. I. Boca Raton, Florida: CRC Press, Inc. 568 p. See p. 100-77. [174 ref]

• ***Summary:*** This substantial section on the soybean, with its own list of references, is a subchapter within the larger chapter titled "Grain legume species of significant importance in world agriculture." Contents: Introduction. Floral characteristics. Environmental regulation of flowering. Chemical regulation of flowering. Genetics. Table 1 shows "Genes know to regulate floral characters in soybeans."

"There can be no doubt that among the grain legumes, soyabeans (*Glycine max* L. Merrill) are the best known, most researched, and the species of principal economic importance in world agriculture. Soyabeans have probably received more research attention than all the other grain legume crops combined, although, ironically, little of the resultant information has contributed to improved productivity in the field...

"Except in photoperiodism and symbiotic dinitrogen fixation, frequent subjects for 'basic studies', research on the physiology of the soyabean crop has lagged behind that in breeding and genetics, although interest in and financial support for all aspects of research has increased substantially during the past 10 to 15 years. A large proportion of the sources of information on the soyabean crop have been written by American scientists and published in that country...

"The genus *Glycine*, after a turbulent taxonomic history, is now composed of six perennial species of primarily Australian distribution placed in a subgenus *Glycine*, and two annual species, the wild *G. soja* and the cultivated *G. max*, in a subgenus *Soja*. Cytogenetic, morphological, and seed protein studies suggest that *G. soja* is the wild ancestor of the cultivated soybean: both annual species are diploid (2n = 40) and there are few, if any, cytogenetic barriers to hybridization between them. In contrast, *G. max* has not been crossed successfully with the six species in subgenus *Glycine*...

"Three growth habits have been described in soyabeans; they are determined by two major genes and have different flowering and stem termination characteristics. In the determinate and semi-determinate types, stem elongation diminishes more slowly and stems terminate in a series of small one- or two-flowered axillary inflorescences crowded together by short internodes at the stem apex, or in a very small leaf. Vegetation growth ceases at about the time flowers first appear in the determinate types, but in the indeterminate about 75% of the vegetation biomass is produced after flowering. Semi-determinates resemble the indeterminate types, except that stem growth and flowering cease more abruptly and 7 to 10 days earlier. The indeterminate types are usually taller and less-branched than the determinates; they are grown at latitudes north of about 38°N in the U.S. whereas determinate types occupy virtually all of the production areas south of about 36°N. Determinate types flower later and at a higher node than the indeterminates in the north, which come into flower at the fourth to eighth node when plants are 30 to 35 cm tall. The fact that flowering, pod-filling, and vegetative growth proceed concurrently in indeterminate types allows them to develop a large source capacity along with a long reproductive period and so to produce large yields in the shorter seasons which prevail at more extreme latitudes." Address: 1. Plant Environment Lab., Dep. of Agriculture and Horticulture, Univ. of Reading, Shinfield Grange, Reading, Berkshire, England; 2. Dep. of Agriculture and Horticulture, Univ. of Reading, Earley Gate, Reading, Berkshire, England.

1086. **Product Name:** Light Foods Soymilk.
Manufacturer's Name: Light Foods.
Manufacturer's Address: 37 Richards St., Hindmarsh, SA 5007, Australia.
Date of Introduction: 1985?

1087. **Product Name:** Simply Better Soymilk.
Manufacturer's Name: Simply Better.
Manufacturer's Address: 24-B Braeside Dr., Braeside, VIC 3195, Australia.
Date of Introduction: 1985?

1088. Kotzsch, Ronald E. 1986. Japan's natural foods pioneer: Mitoku's success is due to its network of quality suppliers. *East West Journal*. Jan. p. 18, 20-25.

• ***Summary:*** Mitoku "has been and (at present) remains the larger of the two main exporters of natural foods from Japan. With its chief competitor, Muso Shokuhin (see Sept. 1984 EWJ), it shares the bulk of a $14-million-a-year market for superior Japanese food products.

"The central office of Mitoku is located in the prestigious Marunouchi building, in front of Tokyo Central Station... There is a staff of six Japanese and two foreigners (Christopher Dawson, a new Zealander, and Robbie Swinnerton, an Englishman)...

"The founder, sole owner, and guiding spirit of Mitoku is Akiyoshi Kazama, now fifty-five years old... A graduate of Waseda University in Tokyo, Kazama was selected in 1956 to study business in the United States... He became the first Japanese national to serve in the American Army following World War II. After two years as an American G.I. in Korea and Japan, Kazama returned to Japan and settled in Tokyo. He became an import-export agent for a German company dealing in opticals and electronics. Then in 1967 he got involved in the emerging natural foods business...

"At the time the newly formed Erewhon Trading Company of Boston was trying to import foods directly from Japan. Its owner, macrobiotic teacher Michio Kushi, was introduced to Kazama by letter through a mutual friend.

Kazama agreed to use his trade expertise to ship $3,000 worth of high-quality Japanese foods, selected by Kushi, to Boston...

"In 1969 Kazama formed a separate company to handle steadily increasing shipments, and called it Mitoku. Through the 1970s Mitoku continued to grow. It remained the principal supplier of Erewhon, which had become a leader of America's natural foods industry. Also, it played an important role in the development of other companies such as Janus, Laurelbrook, and Oak Feed... The company moved into the European market as well, becoming a major supplier of Lima of Belgium, Sunwheel of England, and other major distributors...

"When in the fall of 1981 Erewhon finally collapsed, Mitoku was its largest creditor and took a $300,000 loss. Erewhon's demise nearly destroyed Mitoku... Mitoku has become a major supplier to Westbrae, Great Eastern Sun, Tree of Life, and the reborn Erewhon, all vigorous American firms...

"Over the last five years, Mitoku's annual sales have grown at about 20 percent a year. During the 1984-85 fiscal year gross sales were about $7.5 million. During that period Mitoku bought some 300 food products from eighty-three producers... It sold to fifty-six customers around the world, including ten in North America and about thirty in Europe...

"Just this past month, Mitoku has introduced a line of especially high quality products under its own label."

The author and Mr. Kazama visited a number of Mitoku's suppliers. Descriptions are given of Mansan Company Ltd. (making tamari and soybean miso since 1895), Sendai Miso Shoyu Co. Ltd. (the Sasaki family which runs the company started making miso in 1853), Fukaya Honten Shoyu (a small maker of organic shoyu).

1089. *Australian Dairy Foods*.1986. "Tofutti" takes off in Australia. Feb. p. 84.

• ***Summary:*** Distributor with sole Australian franchise for Tofutti is David Grossbaum of Shoyu Natural Foods in Melbourne. Photos show: (1) Dale Code and David Grossbaum making soft serve Tofutti. (2) "Some of the soy foods now being marketed in capital city health food shops:" Earth Angel Soyoghurt (tub), Pureharvest Soy Drink (two sizes, Vanilla, Tetra Brik), Soypreme natural soymilk in a Pure-Pak carton made near Melbourne, and Bonsoy soymilk (Barley Malt flavor in a Tetra Brik carton) imported from Japan. Address: Australia.

1090. **Product Name:** Sustagen Gold (Dairy-soy Energy Drink) [Dutch Chocolate, or Honey Nut].
Manufacturer's Name: Bristol Meyers.
Manufacturer's Address: Australia.
Date of Introduction: 1986. February.
Ingredients: Milk, soy protein?
Wt/Vol., Packaging, Price: 250 ml Combibloc.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Australian Dairy Foods. 1986. Feb. p. 84. "Sustagen Gold uses dairy and soy foods. The increasingly popular Combibloc carton is now being used by Bristol Myers for Sustagen Gold, a high-protein, high-carbohydrate milk-based nutritional energy drink using dairy and soy foods." The new product has been under development for the past 2 years in Australia, with assistance from the CSIRO division of food research. The vitamin- and mineral-rich drink comes in the single-serve 250 ml pack in two flavors. The product is being contract packed by Murray Goulburn at its Leongatha UHT plant.

John Wilson. 1987. Jan. Soyfoods (ESFA). p. 27-28.

1091. Ainuu, H.L. 1986. The livestock feed industry in Western Samoa: Problems and prospects. *Alafua Agricultural Bulletin (Apia, Western Samoa)* 11(1):51-58. Jan/April. [1 ref]

• ***Summary:*** This paper was presented in Nov. 1985. Soybean meal is mentioned twice. First as a minor ingredient in "pig concentrate," an "imported commercial product which comprises sunflower meal, cottonseed meal, meat and bone meal, poultry offal meal, soybean meal, vitamins and trace minerals." And second as a major ingredient in "poultry concentrate, an imported commercial mixture of soyabean meal, sunflower meal, poultry offal meal, meat and bone meal, rock phosphate, vitamins and trace minerals..."

Samoa Feeds Limited was initially established in 1977 with a Grant from the Government of New Zealand. It was first known as a Western Samoa Trust Estates Corporation (WSTEC). It presently has two shareholders, the Government of Western Samoa (67%) and WSTEC (33%). The company makes a full range of feeds for animals, including poultry feeds (80% of total), pig feeds (19%), and other (1%). 85-90% of the raw materials for these feeds are imported. The company's main ingredient requirements are (in tonnes/year): Yellow maize grain 550-600. Cassava root meal 330-350. Copra meal 200-250. Meat and bone meal 200-250. Pigeon pea/cowpea 80-100. Other 50. Recently, of the first time in 8 years, local maize, cassava chips, and field peas have come into the Feedmill from local farmers. No mention is made of soybeans having come into the mill or having been grown locally. Address: Manager, Samoa Feed Ltd., Vaitele, Western Samoa.

1092. Agricultural Research Centres: A world directory of organizations and programmes. 8th ed. 2 vols. 1986. Essex, England: Longman. 1138 p. 28 cm.

• ***Summary:*** Vol. 1 is A to M, and Vol. 2 is N to Z. Within each volume, the organizations are listed by country. There is a "title of establishments" index and a subject index. In the subject index, under soya beans (p. 1134) we find listings for organizations that are conducting soybean research in the following countries: Australia (6), Belgium (1), Bolivia (1), Brazil (5), Burkina Faso (1), Cameroon (1), Canada (4), French Overseas Departments (1) France (1), Honduras (1), Indonesia (1), Mexico (1), Peru (1), Romania (1), Sri Lanka (1), Swaziland (1), Taiwan (2), Thailand (2), United Kingdom (1), USA (4), Venezuela (1), Zambia (2), Zimbabwe (1).

1093. Lynam, Frances. 1986. Happy birthday tofu, happy birthday tofu [David Mintz about to celebrate Tofutti's fifth birthday]. *Register (Shrewsbury, New Jersey).* June 25. p. 6B, 7B.

• ***Summary:*** "In 1971 Mintz read about tofu in a health magazine... For the next 10 years he spent all his free time creating Tofutti. 'It was a whole new world. It became an obsession.' Today more than 38,000 outlets in all 50 states carry the product. It is also sold in Canada, Australia, Korea, Hong Kong, and the U.S. Virgin Islands. Recently he developed an 'egg' without cholesterol called 'Eggwatchers' and a coffee whitener without milk."

1094. Hanes, Phyllis. 1986. Try designer ice cream for hot treat: Frozen, upscale novelties can be an expensive splurge. *Christian Science Monitor.* June 26. p. R41.

• ***Summary:*** The word "novelties" refers to "ice pops, fudge sticks, covered ice cream balls or squares, frozen fruit juices, frozen tofu or yogurt on a stick, and fancy ice cream cones, cups, or bars with or without sticks."

The United States leads the world in per capita production of ice cream and related products with 44.13 pints per person. Australia is 2nd with 37.21 pints (down 15.7%), followed by New Zealand (35.87), Canada (31.88), and Sweden (28.57).

1095. **Product Name:** Bean Supreme Tempeh.
Manufacturer's Name: Bean Supreme Ltd.
Manufacturer's Address: P.O. Box 78-084, Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1986. June.
Ingredients: Whole soybeans, water, Rhizopus culture.
Wt/Vol., Packaging, Price: 300 gm poly bag, vacuum packed.
How Stored: Refrigerated.
New Product–Documentation: Label. 1986, undated. 6 by 8 inches. Orange and brown. "High protein. Cholesterol and lactose free." Form filled out by Trevor Johnston, Marketing Director. 1989. April. This product was introduced in June 1985. They now make 800 lb/month. Label. 1989. 3.75 by 4.5 inches. Blue and white. Self adhesive on seam-sealing plastic bag. "High protein. No cholesterol. Rich in B-12. Keep refrigerated. Slice and fry. Bake or steam. (Black spores on surface are normal and beneficial to the flavor and quality)."

1096. **Product Name:** Curry Tempeh Pies.
Manufacturer's Name: Nectar Soy Products.
Manufacturer's Address: 57 Vincent St., Daylesford, VIC, 3460, Australia. Phone: 053-48-2051.
Date of Introduction: 1986. June.
New Product–Documentation: Letter (fax) from Ross Hamilton and Mike Manser. 1990. Sept. 13. This was the company's third product, introduced in June 1985 after the company had moved from Geelong to Daylesford in May 1985.

1097. *Yomiuri Shinbun (Yomiuri Daily News, Tokyo).*1986. Tôfu no junsui-sa de jinsei-kan kae sai-shuppatsu [Because of the purity of tofu, he changed his outlook on life and started a new career (Michael Horne now makes tofu in Australia)]. July 7. [Jap]

• ***Summary:*** Michael Horne has started to make tofu in Australia at Mt. Coolangbura, Bombala, New South Wales 2632. A photo shows Horne cutting tofu in a forming box with a woman in the background.

Michael went to Japan with his parents in 1971; he stayed for 8 months. After graduating from the university, he attended law school for 3 years. But he disliked being a lawyer, so he gave up that career and dropped out for 5 years until he saw books on tofu production and miso production at his parents' home. He made some tofu successfully at home, then started a tofu shop, while his wife baked bread to sell. Their home in the mountains is located 100 km from their nearest customers. He had a steady tofu business by 1983. Address: Japan.

1098. American Soybean Association. 1986. Soya Bluebook '86. St. Louis, Missouri: American Soybean Assoc. 278 p. July. Index (bold face type indicates advertiser). 22 cm.

• ***Summary:*** Contents: Index of advertisers (p. 4). Soybeans: Your profit opportunity, by Dr. Kenneth L. Bader, CEO, ASA (p. 5). Organizations (by country, within each country alphabetically): For each gives the name, address, contact person, year founded, number of members, objectives and activities, publications. Countries are: USA, Australia, Austria, Bangladesh, Belgium, Brazil, Canada, England, Germany (Federal Republic of), Finland, France, Hungary, India, Indonesia, Italy, Ivory Coast, Japan, Malaysia, Mexico, Netherlands, Norway, Philippines, Portugal, Senegal, Spain, Sweden, Taiwan, Turkey, Yugoslavia, Zaire, Zimbabwe. U.S. agricultural education, research & extension (by state; mainly state agricultural / land-grant colleges), ASA international offices and world regions (colored world map and photo of each country director), government trading agencies.

Soy directory: Oil extraction plants / refineries (alphabetically by state in USA, then by country), soyfoods / edible soy products manufacturers (lecithin, soy flour, soy grits, soy protein concentrates & isolates, textured soy protein, binders, extenders, simulated meat products, soy oil products {margarine, shortening, cooking / salad oil, salad dressings}, soyfoods–beverages [soymilk], frozen desserts, soy sauce, tempeh, tofu, whole soybean snacks {soynuts}, other soy-based foods), within each product by country, producers of soy products for industrial manufacturers (by products, etc.): Industrial lecithin, industrial soy flour / soy protein, industrial soy oil, soy sterols and tocopherols, soybean fatty acids.

Soybean manufacturing support industries: Manufacturing equipment & supplies, soybean processing equipment & supplies, manufacturing services. Marketing and auxiliary services: Brokers, financial services, forwarding agents, marketing consultants, trading companies, transportation, warehousing–export / import.

Soy statistics (tables & graphs): Soya conversions [weights & measures], metric conversions, temperature conversions. U.S. soybean planting and harvesting dates (by state). U.S. soybean acreage, yield and production, 1925–1985 (by year). U.S. soybean planted acreage by state (1970–1985). U.S. soybean harvested acreage by state (1970–1985). U.S. soybean yield by state (1970–1985). U.S. soybean production by state (1970–1985). U.S. soybean production major crops (1920–1985): One graph each for soybeans, corn, wheat, and cotton. U.S. harvested acreage of major crops (1920–1985): One graph each for the big 4. U.S. yield per acre of major crops (1920–1985): One graph each for the big 4. Argentine soybean area, yield and production by province (1975-1986). Brazilian soybean area, yield and production by province (1975-1986). Canadian soybean production: Acreage, yield, production, farm price and value (1950-51–1984-85). Canadian soybean production and utilization (1950-1984, year beginning Aug. 1): Production, imports, supplies, exports of beans, processed for oil and meal, soy oil produced, soybean oilcake produced. World soybean production: Area and production in specified countries and the world total (1980/81–1985/86). Soybean production by major countries (one graph, 1925-1985): U.S., Brazil, PRC [China], Argentina. Share of world soybean production [percentage] by major countries (one graph, 1925-1985): Big 4. Soybean acreage by major countries (one graph, 1925-1985): Big 4. Share of world soybean acreage [percentage] by major countries (one graph, 1925-1985): Big 4. U.S. soybeans: Supply, disposition, acreage, yield and price (1970–1986). Soybean usage in the U.S. for crush and exports (one graph, 1925-1985, million bushels). U.S. soybean exports: Percent of total usage (one graph, 1925-1985). Argentine soybeans and products (oil and meal): Supply and disposition (1975/76–1986/87). Brazilian soybeans and products (oil and meal): Supply and disposition (1975/76–1986/87). Prices of U.S. soybeans, No. 1 yellow: Average price per bushel, Illinois country shipping points (by year and month, 1950–1984, dollars). Prices of U.S. soybeans received by farmers: Average price per bushel (by year and month, 1950–1984, dollars). U.S. soybean price support operations (1945-1985, incl. CCC). U.S. soybean crop value: U.S. and major producing states (1925-1985): Illinois, Iowa, Indiana, Ohio, Missouri, Minnesota, Arkansas. Fold-out color map of U.S. soybean acreage by county. U.S. farm marketings of soybeans: Percent of open market farm sales by month (1975/76–1984/85). Map of U.S. soybean processing plants. Value of U.S. soybean products per bushel and crush margin (1950-1984): Soy oil, soybean meal, soybean price (received by farmers, No. 1 yellow Illinois), margin (ditto). U.S. soybean meal: Prices paid by farmers–44% protein, dollars per 100 lbs, by year and month (1950-1984). U.S. soybean meal: Average wholesale price–44% protein, dollars per ton, bulk Decatur, Illinois, by year and month (1950–1984). U.S. soybean meal: Beginning stocks, production, exports and domestic disappearance, by year and month, thousand short tons (1978/79–1984/85). U.S. soybean cake and meals: Supply, disposition and price (1977-1985): Soybean, cottonseed, linseed, peanut. Major world protein meals: Supply and utilization (1981/82–1985/86; Production, exports, imports, consumption, ending stocks): Soybean, cottonseed, rapeseed, sunflowerseed, fish, peanut, copra, linseed, palm kernel. World major oilseeds: Supply and utilization (1981/82–1985/86). World major vegetable and marine oils: Supply and utilization (1981/82–1985/86). Prices of U.S. soybean oil: Soy oil, domestic crude, average cents per pound in tank cars at Midwestern mills, by year and month (1950/51–1984/85). U.S. soybean utilization, by year (1960-1984): Food–Shortening, margarine, cooking and salad oils, other edible, total. Nonfood–Paint and varnish, resins and plastics, fatty acids, other inedible (incl. soap), total. Total domestic utilization. U.S. soybean oil value as percent of total soybean value (1930–1985). Note: Peaked at about 55% in 1930, fell to about 32% in 1980-81. U.S. soybean oil: Supply, disposition and price (1960-1985). U.S. edible fats and oils: Supply and disappearance (1978-1985): Coconut, corn, cottonseed, lard, palm, peanut, soybean, sunflower, tallow (edible). U.S. exports of soybeans, by year and month (1953–1984). U.S. soybean exports by port and country of destination (Sept. 1984–Aug. 1985): Ports are–St. Lawrence Seaway, Lakes, Atlantic, Gulf (by far the largest), Pacific, Interior. U.S. exports: Soybeans–Volume of exports by country of destination (in metric tons) and total value (1981–1985). U.S. exports: Soybean oil–Volume of exports by country of destination (in metric tons) and total value (1981–1985). U.S. exports: Soybean oilseed cake and meal–Volume of exports by country of destination (in metric tons) and total value (1981–1985). Map of U.S. soybean exports by port areas: Sept. 1984–Aug. 1985 (1,000 bushels). U.S. exports of soybean, cottonseed and sunflowerseed oils: U.S. commercial and P.L. 480 exports–Volume of exports by region and country of destination (in metric tons) and total value (1979/80–1984/85; year beginning in October). U.S. exports: Soybean oil–P.L. 480, Title I and III, volume (in metric tons) and value (in $1,000) by country of destination (FY 1981–1985). U.S. exports of soybean and cottonseed oils: U.S. commercial and P.L. 480 exports (1950–1984, million lbs; incl. P.L. 480 as a percentage of the whole). Brazilian exports of soybeans and products to major countries (1,000 metric tons; 1976-1984). Graph of soybean & product exports by major countries (U.S., Brazil, Argentina) (soybean equivalent; 1970-1985). Graph of world share of soybean & product exports by major countries (U.S., Brazil, Argentina) (1970-1985). Note: U.S. share has fallen from 95% in 1970 to about 50% in 1984.

Glossary: General terms, soy protein terms. Standards & specifications: NSPA, Association of American Feed Control Officials (AAFCO), USDA (definitions and grades). Index. Address: P.O. Box 27300, St. Louis, Missouri 63141.

1099. Bean Supreme Soyfoods. 1986. Price list. P.O. Box 78 084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand.
• ***Summary:*** The company makes Tofu, Tempeh, Cottage Spread, Soymilk, Soysage, and Non-Dairy Frozen Dessert. Address: Grey Lynn, Auckland, New Zealand.

1100. **Product Name:** Bean Supreme Non-Dairy Frozen Dessert [Vanilla, Carob, Orange/Mango, or Strawberry]. Renamed Lite Licks in Oct. 1986.
Manufacturer's Name: Bean Supreme Soyfoods.
Manufacturer's Address: P.O. Box 78 084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1986. July.
How Stored: Frozen.
New Product–Documentation: Manufacturer's price list. 1986. July. Sold in 1.5 and 9 liter sizes.

1101. **Product Name:** Bean Supreme Soymilk.
Manufacturer's Name: Bean Supreme Soyfoods.
Manufacturer's Address: P.O. Box 78 084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1986. July.
New Product–Documentation: Manufacturer's price list. 1986. July. Sold in 0.5 and 2 liter sizes.

1102. **Product Name:** Bean Supreme Cottage Spread (Non-Dairy Tofu Cottage Cheese).
Manufacturer's Name: Bean Supreme Soyfoods.
Manufacturer's Address: P.O. Box 78 084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand.
Date of Introduction: 1986. July.
New Product–Documentation: Manufacturer's price list. 1986. July. 250 gm size.

1103. Bean Supreme Soyfoods. 1986. Tofu (Leaflet). Box 78-084, Grey Lynn, Auckland 1, New Zealand. 3 panels each side. Front and back. Each panel 21 x 10 cm. Undated.
• ***Summary:*** Printed with purple ink on beige paper. On the front panel, below the large, bold letters "Tofu," is written (on a purple background): "High protein. No cholesterol. Low fat. Low calorie. Ingredients: Soybeans, water, natural coagulant (nigari). No preservatives. The bottom half of panel 1 is about "Bean Supreme tofu." Panel 2 contents: Nutritional content. Low fat and cholesterol. Weight watchers. Vitamins and minerals. Storage. Let's eat... There are 11 recipes, starting with Chili con tofu, accompanied small illustrations from *The Book of Tofu*, by Shurtleff & Aoyagi. After the last recipe: "Bean Supreme Soyfoods: manufacturers of Tofu / Tofu Cottage Spreads, Tempeh–Fermented Soybean Cake. Below that is an order form for 4 books on tofu and tempeh. Address: Auckland, New Zealand.

1104. **Product Name:** Aussie Soy [Natural, Vanilla, Carob, and Barley Malt {with Chocolate}].
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor). Made in Australia.
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1986. July.
Wt/Vol., Packaging, Price: 1 liter Tetra Brik carton.
How Stored: Shelf stable.
New Product–Documentation: Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In July 1986 they introduced their first Australian-made 1 liter soymilk product named Aussie Soy in four flavours in a Tetra Pak carton.

1105. **Product Name:** Fresh Organic Tempeh.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1986. July.
Ingredients: Organic soybeans, water, cider vinegar, and culture *(Rhizopus oligosporus)*.
Wt/Vol., Packaging, Price: 250 gm in plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in July 1986. Brown, red and white on yellow. Front panel: "No cholesterol. Source of protein and vitamin B12. Complete protein food. Excellent meat substitute. Fry, bake, grill or steam for a quick and easy meal. Fitness food. Bermutu Tinggi."

1106. *Sunset (Menlo Park, California)*. 1986. What's the marinade's mystery ingredient? Miso. 177:157-58. July.

• ***Summary:*** Seventh-day Adventists make Marmite, but Vegemite has most of the market. Includes recipes.

1107. **Product Name:** Tempeh Burger.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1986. August.
Ingredients: Organic soybeans, water, soy sauce, sunflower oil, cider vinegar, spices, herbs, and culture *(Rhizopus oligosporus)*. "Black spots are normal sporulation and do not indicate spoilage."
Wt/Vol., Packaging, Price: 200 gm in plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Aug. 1986. Orange, green, yellow, black and white on red. "Sandwich filling. Ready to serve, hot or cold."

1108. Smith, Paul. 1986. General comments on F.G. Roberts, his philosophy and company, and the history of Soy Products of Australia Pty. Ltd. Bayswater, Victoria, Australia. 5 p. Unpublished manuscript. Handwritten.
• ***Summary:*** F.G. Roberts' philosophy of health: "F.G. Roberts was opposed to smoking and alcohol consumption. He believed in and prescribed mainly eating fresh fruit and vegetables, followed next by whole grains, with all concentrated foods like meat, nuts, eggs, cheese and dairy foods being eaten sparingly. Roberts was also strongly opposed to all highly refined and processed foods, particularly white flour and white sugar. He discouraged the use of tea and coffee due to their caffeine content and acid forming tendencies. He recommended that salt be used sparingly and that it should be cut out entirely where the kidneys may be overloaded as in the case of pregnant women.

"Roberts believed that a well-planned and balanced diet should provide the body with all necessary minerals, vitamins and nutritional elements without the need to resort to mineral and vitamin supplements. However such supplements may be necessary for people who live in flats in inner city areas and have no access to *fresh* fruit and vegetables. He also believed that by careful attention to diet and exercise the body would become self-cleansing and self-healing, and that many common health problems and diseases could be avoided. The latter usually stemmed from nervous disorders, emotional problems, poor blood circulation, poor food combinations, inadequate diet, faulty elimination of bodily waste products, or complex combinations of these factors.

"Roberts believed that simple prevention was better than a cure after your bad habits had caught up with you. He was opposed to the use of drugs since the side effects were often worse than the initial problem. In most cases he was opposed to surgery, regarding it as a last resort. He did not believe in any procedures which interfered with any of the body's immunity systems or normal functions. He believed in assisting the body to sort out its own problems and heal itself.

"All the products formulated and developed in the 1930s by F.G. Roberts were designed for their basic healthy and nutritional qualities and to address some of the deficiencies in conventional diets and foods. All were made form whole seeds, grains, etc. Most of the community suffers from constipation, acidity, mineral deficiency, or kidneys and livers overloaded with toxic waste products.

Roberts advocated the use of molasses for its high mineral content, its alkaline reaction, and its mildly laxative qualities. Alfalfa Tea was developed as a tea and coffee substitute, for its high natural mineral content and its gentle alkalising qualities. Malted and Vita Bran were designed to introduce additional dietary fiber or roughage into the diet in a pleasant way. Cleansing Herbs is a natural herbal laxative product with no addictive or side effects problems; it is particularly useful for the older person with sluggish bowel movements. Soy Compound was developed as a milk substitute and is particularly useful in cases where dairy milk cannot be tolerated. Vita Elm, with the healing properties of slippery elm, is a bland, nutritious cereal for the very young and the elderly.

F.G. Roberts believed in three good, satisfying meals a day. He disapproved of snacking, and thought that most people eat too much too often, overloading their digestive system, liver, and kidneys.

F.G. Roberts believed that the first step in healing any human complaint was to increase intake of fluids and to get the bowels moving regularly once or twice a day to eliminate the buildup of waste products. He also advocated exercise programs–the forerunner of the current aerobic exercise programs–to stimulate muscles, organs, and blood circulation. He would recommend a cleansing diet, followed by a gradual return to a balanced diet in which the quality, quantity and mixtures of foods would be carefully considered depending on the age, physical type and occupation of each person.

F.G. Roberts was an expert iradiagnostician. A favorite trick was calling unknown people from lecture audiences and tell them where and when bones had been broken, what operations they had had, what drugs and medication they were taking, and many other things not apparently obvious. His knowledge of and ability to read people healthwise and personality wise was almost uncanny. He was once arrested and jailed for fortune telling based his knowledge of iradiagnosis. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1109. Mitchel, Diana. 1986. Re: New developments with soymilk in Australia. Letter to William Shurtleff at Soyfoods Center, Sept. 1. 2 p. Handwritten.

• ***Summary:*** (1) Castle Trading (Ranwick, NSW) are now selling non-sweetened fresh soymilk in 2 litre containers at $3.00 Australian. (2) Biogenic (owned by Russels-Russels, which is owned by a New Zealand health chain) are selling 1 litre Tetra packs sweetened with honey at $3.40 each. (3) Sanitarium Health Food Company, a Seventh-day Adventist chain, are producing their own soya milk. It is apparently nice and cheap. (4) Soyfoods Australia P/L [Pty. Ltd.] at 14/2 Paton Place, Manly Vale (Phone: 02-949-7314) are producing soy milk "and have just spent $100,000 on equipment that is quite unsophisticated in comparison to the English equipment I was thinking of buying. Anyhow, they are contracting to sell fresh soya milk to all Coles supermarkets in NSW in plastic bottles." (5) Quite a few brands are selling in NSW, including: "Simply Better" (24-B Braeside Drive, Braeside, VIC 3195. Phone: 03-580-8505); Light Foods (37 Richards St., Hindmarsh, SA 5007); Earth Angel Soy Foods (Mt. Waverley, Victoria). Address: Squirrels on the Park, P.O. Box 4, Surry Hills 2010, NSW, Australia.

1110. Jackobs, Joseph A.; Smyth, C.A.; Erickson, D.R. 1986. International soybean variety experiment: Eleventh report of results, 1984. *INTSOY Series* No. 29. xvi + 168 p. Sept. (College of Agric., Univ. of Illinois at Urbana-Champaign).

• ***Summary:*** "This is the final report of the International Soybean Variety Evaluation Experiments (ISVEX)... ISVEX has been the major component of INTSOY's genetic development program since 1973." Joseph A. Jacobs provided leadership to the ISVEX trial program. Pages viii–xvi contain a complete listing of about 65 cooperating centers and researchers worldwide.

During 1984, soybeans were grown at 96 sites (the name of each site is given) in the following countries: Antigua, Argentina, Bangladesh, Burma, Cameroon, China, Colombia, Costa Rica, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Ethiopia, French Guiana, Ghana, Honduras, Indonesia, Iran, Ivory Coast, Korea, Laos, Liberia, Madagascar, Malaysia, Mexico, Nepal, New Caledonia, Pakistan, Paraguay, Philippines, Portugal, Rwanda, Saint Vincent, Somalia, South Africa, Sri Lanka, Sudan, Swaziland, Tanzania, Turkey, United States, Venezuela, Vietnam, Yugoslavia, Zambia, Zimbabwe.

In 1982, soybeans were grown in Morocco. In 1983 soybeans were grown in Brazil and Rwanda.

In 1985, soybeans were grown at 43 sites in China, Ecuador, Ethiopia, Gabon, Ghana, Guatemala, Iran, Jamaica, Korea, Mexico, Nepal, Pakistan, Paraguay, Philippines, Portugal, Sri Lanka, Thailand, Turkey, United States, Venezuela, Yugoslavia, Zaire, and Zimbabwe.

1111. Sutardi, -; Buckle, K.A. 1986. The characteristics of soybean phytase. *J. of Food Biochemistry* 10(3):197-216. Sept. [34 ref]

• ***Summary:*** Soybean phytase showed an optimum pH of 4.8 and optimum temperature of 60ºC. Address: Dep. of Food Science & Technology, The Univ. of New South Wales, P.O. Box 1, Kensington, NSW 2033, Australia.

1112. **Product Name:** Lite Licks (Premium Frozen Dessert; Non-Dairy) [Honey Vanilla, Wildberry, Almond Fudge, Fruit Fiesta, Chocolate, Piña Colada, Lemon Spearmint, Orange, and Mango].

Manufacturer's Name: Bean Supreme Ltd.

Manufacturer's Address: P.O. Box 78 084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand. Phone: 09-764-988.

Date of Introduction: 1986. October.

Ingredients: Honey Vanilla: Corn syrup, vegetable oil, honey, fructose, soy protein, vegetable emulsifier (471), stabiliser (410, 412), sea salt, vanilla extracts, carotene colour (160A). Water added.

Wt/Vol., Packaging, Price: 2 liter or 475 ml cartons.

How Stored: Frozen.

Nutrition: 75 calories per 100 ml.

New Product–Documentation: Manufacturer's price list. Sold in 1.5 and 9 liter sizes. Form filled out by Trevor Johnston, Marketing Director. 1989. April. Lite Licks non-dairy dessert was introduced in Oct. 1986. They are now producing 15,000 liters/month. "Lite Licks has been an outstanding success with lots of growth ahead of it still." Bean Supreme Price List. 1989. March. The first 5 flavors are sold in 2 liter packs. Honey Vanilla, Wildberry, Almond Fudge, Piña Colada, Lemon Spearmint, Orange, and Mango are sold in 475 ml packs. Labels. 1989. 6 inches square with rounded corners. Self adhesive. Each has a striking full-color drawing. Honey Vanilla shows a cowboy standing by a cactus in the desert holding an ice cream cone. Fruit Fiesta shows a Latin lady dancing by a seaside palm with a basket of fruit on her head. Almond Fudge shows a Britisher in a pith helmet seated in the desert with a butterfly net and ice cream cone, and Africans silhouetted behind him. Chocolate shows an Indian chief in headdress holding an ice cream cone and bow & arrow. Wildberry shows a woman standing by the beach holding an ice cream cone and beach ball. Each bears the same slogan in the lower right corner: "No cholesterol. Natural ingredients. Honey sweetened. Non-Dairy. 75 calories per 100 ml."

Talk with (call to) Bean Supreme Ltd. in New Zealand. 1994. June 26. The company's new address is: 14 Hugo Johnston Dr., P.O. Box 12082, Penrose, Auckland, New Zealand. Phone: 09-579-0592.

1113. Tam, Alan. 1986. Re: The tofu industry in New Zealand. Letter to William Shurtleff at Soyfoods Center, Nov. 18. 2 p. Typed, with signature on letterhead.
• ***Summary:*** Alan's company started making tofu about 8 years ago (1978). Note: See Alan's letter of 2 May 1985 in which he says that he initially made tofu on a small scale, making it for friends and family only. But in "recent years" he has been making it on a commercial scale. It is not clear to which phase this 1978 date refers.

His company's current tofu production averages about 1,000 pounds week.

Alan knows of only three commercial tofu manufacturers in New Zealand. Bean Supreme in Auckland makes 1,000 to 1,500 lb/week. Sun Hing Foods Co. in Wellington (founded 1978) makes 1,000 to 1,200 lb/week. SoySource Tofu in Christchurch makes about 500 lb/week. Addresses of the first two companies are given. Address: P.O. Box 14-213, Kilbirnie, Wellington 3, New Zealand. Phone: (04) 877 313.

1114. Hegsted, D.M. 1986. Calcium and osteoporosis. *J. of Nutrition* 116(11):2316-2319. Nov. [36 ref]
• ***Summary:*** Osteoporosis is largely a disease of affluent, western cultures. The author showed a cross-cultural association between total dietary protein intake and hip fracture, and suggested it might be due to protein-induced damage of renal calcitriol regulation. The real issue, he argues, is "whether or not calcium intake is related to the development of osteoporosis." "It seems quite clear that we do not understand the etiology of osteoporosis."

Graphs show: (1) Incidence of hip fractures per 100,000 vs. per capita calcium consumption (mg/day). The three countries with the highest hip fracture rate are the USA, New Zealand, and Sweden. The four countries with the highest calcium consumption are Finland, Sweden, New Zealand, and the USA. The three countries with the lowest hip fracture rate are Singapore, Hong Kong, and Yugoslavia. The three countries with the lowest calcium consumption are Hong Kong, Singapore, and Yugoslavia.

(2) Incidence of hip fractures per 100,000 vs. per capita protein consumption (mg/day). The three countries with the highest hip fracture rate are the USA, New Zealand, and Sweden. The four countries with the highest protein consumption are New Zealand, USA, Jerusalem (Israel) and Yugoslavia. The three countries with the lowest hip fracture rate are Singapore, Hong Kong, and Yugoslavia. The three countries with the lowest protein consumption are Hong Kong, Singapore, and Sweden. Address: Dep. of Nutritional Sciences, Univ. of Wisconsin, Madison, WI 53706.

1115. *Food & Beverage Marketing.* 1986. The F&BM 10: Leading innovators of 1986 [Brightsong]. Dec. p. 18-19.
• ***Summary:*** Brightsong is listed first! "The California-based firm is staking its claim on the popularity of tofu, considered one of the hot growth categories for 1987... Brightsong is changing the nature of its business from a production-oriented company to a product development firm. While still marketing its own product line, Brightsong is licensing the formulation and production processes of several tofu based products. Through these efforts, Rose explains, he has been able to expand his business on an international basis–adding Japan, Australia, and China to its roster." Address: New York.

1116. Ochetim, S. 1986. Nutritional and economic evaluation of substitute feeds for maize and soyabean meal for growing pigs. *Fiji Agricultural Journal* 48:8-11. Jan/Dec. [6 ref]
• ***Summary:*** The author conducted an experiment to investigate the nutritional and economic effects of complete replacement of maize and soyabean meal with cassava, spent grain (brewer's grains, a by-product of beer production), copra cake and oil, and meat and bone meal as alternative energy and protein sources in diets of growing pigs fed from approximately 18 kg up to 60 kg live weight.

Commercial Feed Mill plants in Western Samoa and Fiji have traditionally imported large quantities of maize and soyabean meal (which are very expensive and bulky ingredients) for use as energy and protein sources. The control diet consisted of 75.5% maize and 22.0% soyabean meal, plus small amounts of coral sand and other minor ingredients. Western Samoa Feeds Ltd. is one source of soyabean meal. Though the test diet adversely affected nutritional performance, these adverse effects were more than compensated for by the economic benefits of feed cost savings. Address: School of Agriculture, Univ. of the South Pacific, Alafua Campus, Apia, Western Samoa.

1117. Bean Supreme. 1986. Tofu, tempeh, soysage: Quality vegetable protein (Poster). P.O. Box 78084, 1 Wallingford St., Grey Lynn, Auckland, New Zealand. 59 x 42 cm.
• ***Summary:*** This large, glossy poster, dark purple on white, shows a sliced chub of soysage, two packs of tempeh, add a cake of tofu plus a knife, some soybeans, and a prepared dish. At the lower left: "Bean Supreme–The protein source. All natural. Cholesterol and lactose free. Low sodium. Low calories. No preservatives." Address: Auckland, New Zealand.

1118. **Product Name:** Soypreme: Non Dairy Soy Drink [Regular, or Vanilla].
Manufacturer's Name: Berrivale Orchards.
Manufacturer's Address: McKay Road. Berri, SA 5343, Australia.
Date of Introduction: 1986.
Ingredients: Natural soy bean extract, maltodextrin, malt, flavor [vanilla only], and water added.

Wt/Vol., Packaging, Price: 1 liter PurePak milk-type carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Australian Dairy Foods. 1986. Feb. p. 84. A photo shows "Soypreme Natural Soymilk" in a Pure-Pak carton. It is said to be made near Melbourne.

Form filled out by Margot Sloan, Hawkesbury Agric. College, Private Bag. No. 3., Richmond 2573, NSW, Australia.

Letter from C.H. Lee of Blissquik Food Products. 1992. Feb. 17. This company currently makes Soypreme brand soymilk. Address is the same as shown above.

Note: By 1995 this product had apparently been renamed Good Life: Non Dairy Soy Drink, still sold in a 1 litre PurePak Carton.

1119. Cole, Michael. 1986. Soya Health Foods Ltd. Company profile. Unit 4, Guinness Road, Trafford Park, Manchester M17 1AU, England. 4 p.
• ***Summary:*** Michael Cole is an entrepreneur, born in Manchester, England. The company was formed in 1984 in Manchester. The factory is sited in Trafford Park Industrial Estate and was the first to be built for the sole purpose of Soya Milk manufacture. The company is headed by Mr. M.S. Arora (Chairman), Mr. M.P. Cole (Managing Director), and Burns Anderson p.l.c. (Financial Controllers). Production of Soya Milk began in January 1985. The Sunrise brand is currently being sold throughout the 2,500 independent health food shops and in many supermarkets. The company has 5 products. Their soymilk is private labeled for 5 other companies. Soya Health Foods Ltd. has also been established in Australia and New Zealand, with its own private labels (milk in New Zealand and Burgers, Ice Cream, and Dessert in Australia). Address: Manchester, England.

1120. **Product Name:** Tempeh.
Manufacturer's Name: Nature's Miracle Food Manufactory.
Manufacturer's Address: P.O. Box 23, Earlwood, NSW 2206, Australia.
Date of Introduction: 1986.
New Product–Documentation: Label. 1986, undated. 5.5 by 7 inches. Brown, yellow and red. "High protein. Rich in vitamin B-12. You'll love it. Complete protein food. Excellent meat substitute. Nature's miracle."

1121. Ritchie, Nevil A. 1986. Archaeology and history of the Chinese in southern New Zealand during the nineteenth century... A study of acculturation, adaptation, and change. PhD thesis, University of Otago, New Zealand. *
• ***Summary:*** Is soy mentioned?

1122. **Product Name:** Natures Family Soy Flour.
Manufacturer's Name: Riverland Vegetable Oils Pty. Ltd.
Manufacturer's Address: 46-50 McDonald St., P.O. Box 177, Numurkah, VIC 3636, Australia.
Date of Introduction: 1986.
New Product–Documentation: Soya Bluebook. 1986. p. 84.

1123. **Product Name:** Soymilk.
Manufacturer's Name: Soy Foods Australia P/L.
Manufacturer's Address: Australia.
Date of Introduction: 1986.
Wt/Vol., Packaging, Price: Plastic bottle.
New Product–Documentation: Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update. This company has just spent $100,000 on basic soymilk equipment. They plan to sell fresh soymilk to all Coles supermarkets in New South Wales in plastic bottles.

1124. Lawn, R.J.; Mayers, J.D.; Beech, D.F.; Garside, A.L.; Byth, D.E. 1986. Adaptation of soybean to subtropical and tropical environments in Australia. In: S. Shanmugasundaram and E.W. Sulzberger, eds. 1986. Soybean in Tropical and Subtropical Cropping Systems. Shanhua, Taiwan: Asian Vegetable Research and Development Center. xv + 471 p. See p. 361-72. [30 ref]
• ***Summary:*** "Soybean... production in Australia began, in a limited way, in the late 1960s in southeastern Queensland. Subsequent expansion took place in southern Queensland, and later in New South Wales. Small areas of soybean are presently grown in central Queensland, in the Ord River region of northwest Australia, and in the Douglas/Daly area of the Northern Territory.

"Queensland and New South Wales are the dominant production areas... About two-thirds of the country's soybean is produced in the subtropics of southeastern Queensland at latitudes of 26 to 29°S."

"Because much of the soybean crop in the subtropics is wholly or partly rainfed, production is variable. The soybean industry in southeastern Queensland was initially established with cultivars and selections from the southern USA." Address: 1. CSIRO Div. of Tropical Crops and Pastures, Cunningham Lab., St. Lucia, Queensland 4067, Australia.

1125. Morgan, R.G.H.; Crass, R.A.; Oates, P.S. 1986. Dose effects of raw soyabean flour on pancreatic growth. *Advances in Experimental Medicine and Biology* No. 199. p. 81-89. [35 ref]
• ***Summary:*** "Raw soya flour (RSF) feeding to rats produces pancreatic hypertrophy and hyperplasia, and, if sufficiently prolonged, the spontaneous development of pancreatic neoplasms and the potentiation of pancreatic carcinogens... If 100% RSF is fed for less than 24 weeks

continuously the effects on the pancreas are completely reversible, but feeding for longer than this leads to irreversible progression to pancreatic adenoma and carcinoma over the next 50-70 weeks." Address: Dep. of Physiology, Univ. of Western Australia, Nedlands, WA, 6009.

1126. Shanmugasundaram, S.; Sulzberger, E.W. eds. 1986. Soybean in tropical and subtropical cropping systems: Proceedings of a symposium, Tsukuba, Japan, 26 September–1 October 1983. Revised ed. Shanhua, Taiwan: Asian Vegetable Research and Development Center. xv + 471 p. Illust. Index. 26 cm. [500+ ref. Eng]
• ***Summary:*** Note: The first edition, hardcover, published Oct. 1985, was recalled and discarded, due to errors in the text. Contents: Section 1. Cropping systems. 2. Plant breeding. 3. Management. 4. Diseases and insects. 5. Plant nutrition. 6. Physiology. 7. Economics. 8. Related topics. 59 chapters total. Symposium participants. Author index. Subject index.

In the Foreword, G.W. Sellek, Director General of AVRDC, notes that the proceedings of this symposium were published in two sections. The proceedings of the first section, recently published by the Tropical Agricultural Research Center of Japan (TARC), cover country reports and special research projects. These proceedings cover cropping systems. "In the recent past, research was aimed almost exclusively at raising soybean yields rather than developing cropping systems that provide the stability needed to grow soybeans under high-risk conditions. There also seems to be a greater sense of urgency to integrate cropping systems research with disciplines such as plant breeding, crop management, pest control, and plant nutrition." There is a strong "need to ensure that scientists from a variety of disciplines and backgrounds work together so that their research efforts are well coordinated." Address: AVRDC, Taiwan.

1127. **Product Name:** Soymilk (Fresh & Unsweetened).
Manufacturer's Name: Castle Trading–Ranwick.
Manufacturer's Address: New South Wales.
Date of Introduction: 1986?
Wt/Vol., Packaging, Price: 2 liter container. Retails for $3.00 Australian.
New Product–Documentation: Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update.

1128. **Product Name:** Biogenic Soymilk (Honey Sweetened).
Manufacturer's Name: Russels-Russels.
Manufacturer's Address: Australia.
Date of Introduction: 1986?
Wt/Vol., Packaging, Price: 1 liter Tetra Brik Aseptic carton. Retails for $3.40 Australian.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update. This company is owned by a New Zealand Health Chain.

1129. Tindale, Mary D. 1987. A new North Queensland species of *Glycine* Willd. (Fabaceae). *Brunonia* 9(1):99-103. Jan. 19. [4 ref]*
• ***Summary:*** The new species is *Glycine curvata.* Address: Royal Botanic Gardens, Mrs. Macquarie's Rd., Sydney, N.S.W. 2000, Australia.

1130. Wilson, Geoff. 1987. Special report from Australia [on soyfoods]. *Soyfoods (ESFA)* 1(1):25-29. Jan.
• ***Summary:*** Much of this material appeared in the National Farmer (1984), Australia. John Wilson, in charge of soymilk for Alfa-Laval and Owen Price, managing director of the Dairy Farm group of companies in Hong Kong (he has made a soy ice cream) are both expatriate Australians. Contents: New markets beckon soybeans (especially soymilk in Australia and Southeast Asia). Expatriate Australians boosting soy (John Wilson of Alfa-Laval in Sweden, and Owen Price, managing Director of the Dairy Farm group of companies in Hong Kong). Soybeans poised for big growth (in Australia, especially as soymilk). Tofutti takes off in Australia (David Grossbaum of Shoyu Natural Products in Melbourne has the sole Australian franchise for this popular soy-based product). Tofutti is tantalising U.S. tastebuds. Sustagen Gold uses dairy and soy foods (The increasingly popular Combibloc carton is now being used by Bristol Meters to package this product). Soy-dairy blends to overcome disadvantages. Six new soy drinks expected (following Golden Life, the first Australian soy drink launch late last year by Martin Pharmaceuticals). Soy products will enter the market (in Australia, believes Anders Lindner of STS–Soya Technology Systems). Flavored Soy Drinks selling well (according to Don Lazzaro of Ceres Natural Foods Pty Ltd. in East Bentleigh, Victoria). Address: Freelance journalist, Australia.

1131. **Product Name:** Organic Tempeh, Organic Seasoned Tempeh.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1987. March.
Ingredients: Seasoned: Organic soybean, water, cider vinegar, sea salt, garlic, coriander and culture *(Rhizopus oligosporus).*
Wt/Vol., Packaging, Price: 300 gm in plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in March 1987.

Seasoned: Blue, yellow and red on white. On the front panel: "Nutritious. Cholesterol free... For a high energy breakfast, quick lunch, or hearty main meal. No artificial flavouring, colouring, or preservatives. Improved quality. Fitness food."

1132. Sidhu, G.S.; Upson, Barbara; Malinow, M.R. 1987. Effects of soy saponins and tigogenin cellobioside on intestinal uptake of cholesterol, cholate and glucose. *Nutrition Reports International* 35(3):615-23. March. [20 ref]

• ***Summary:*** In rats, soy saponins reduced cholesterol intake by about 50% and also significantly reduced cholate and glucose uptakes. "The hypocholesterolaemic activity of saponins may be related to their capacity and specificity to interact with cholesterol or bile acids, or both, and thus inhibit their intestinal absorption." Address: 1. CSIRO Div. of Food Research, P.O. Box 52, North Ryde, NSW, 2113, Australia; 2-3. Oregon Regional Primate Center, Beverton, OR.

1133. Anfiteatro, Dominic. 1987. Tempeh in Australia (Interview). *SoyaScan Notes*. April 11. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Dominic began to make tempeh commercially in very early 1980 at his Clear Light Wholefoods, a vegetarian restaurant in Adelaide. Started in 1977, it was the first "health shop" in Adelaide. Tempeh was his first commercial soyfood product. He learned how to make it from Shurtleff & Aoyagi's books. He made tempeh in a little room next to the restaurant and sold it over the counter. Once he saw the potential of tempeh he sold the restaurant to Ananda Marga and specialized in making tempeh. He started his company Light Wave Wholefoods in 1983. He has spoken to many people and thinks his was the first commercial tempeh in Australia. According to the History of Tempeh (Shurtleff & Aoyagi), commercial production began in Australia in 1980. He does not know Cyril and Elly Cane, who were making tempeh by July 1982.

He says the biggest tempeh company in Australia, the Mighty Bean Company in Queensland, produces about 2 tons a month. Dominic now makes about 50 kg/week in Adelaide. Address: Adelaide, Australia.

1134. Saperstein, Hilary. 1987. Kosher "ice cream" fine with or without meat. *Jewish Journal (Fort Lauderdale, Florida)*. April 23.

• ***Summary:*** "David Mintz grew up in an Orthodox Jewish family in New York. He attended Brooklyn College, where he majored in business. He initially joined his family's fur business. Then he founded a small grocery store in Mountaindale, New York. The population was 18 in the winter, thousands in the summer. One day he was reading a nutrition magazine and he read about tofu. Tofutti is now available in the Soviet Union, Japan, Australia, Canada, Hong Kong, and Singapore."

1135. Australian College of Paediatrics. 1987. Policy statement: Soy protein formula. *Australian Paediatric Journal* 23(2):83-84. April. [6 ref]

• ***Summary:*** "There are some well characterized disorders caused by cow's milk protein intolerance (CMPI), but there is also a range of vague signs and symptoms... The rationale for the use of soy formulae is the assumption that soy protein is less antigenic than cow's milk protein and thus should be used in the treatment of CMPI or prophylactically in patients at high-risk for developing CMPI... It seems that soy formula is inappropriate even in cases of proven CMPI because of its ability to cause allergic reactions. In cases of true gastro-intestinal CMPI, use of protein which has been hydrolysed to the point that it is no longer antigenic, is preferred. When all the clinical manifestations of CMPI have resolved, a soy formula may be introduced to test the child's sensitivity to it. If tolerated, it could replace the protein hydrolysate.

"It should not be assumed that all soy formulae are similar. The carbohydrate content differs in each of the 3 commonly available preparations (Isomil: sucrose 44%, corn syrup solids 56%; Prosobee: corn syrup solids 100%; Infasoy: sucrose 25%, corn syrup solids 75%). Sucrose is not the preferred carbohydrate in infancy because of its effect on teeth, development of eating habits and the fact that sucrose malabsorption can occur after gastroenteritis. Thus, if soy formulae are used, preference should be given to those low in sucrose." Address: Australia.

1136. Brown, A.H.D.; Grace, J.P.; Speer, S.S. 1987. Designation of a "core" collection of perennial *Glycine*. *Soybean Genetics Newsletter* 14:59-70. April. [5 ref]

• ***Summary:*** The International Board for Plant Genetic Resources recognizes the more than 1,400 accessions held in Canberra, Australia, as the world base collection for perennial *Glycine*. The 12 species include 5 that have been described recently: *G. argyrea*, *G. cyrtoloba*, *G. curvata*, *G. microphylla*, and *G. arenaria*. Address: CSIRO, Div. of Plant Industry, Genetic Resources and Biosystematics Program, Canberra, Australian Capital Territory 2601, Australia.

1137. **Product Name:** Sanitarium Health Foods So Good: The Non-Dairy Soy Drink (Soymilk).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia.
Date of Introduction: 1987. April.
Ingredients: Soya isolate, vegetable oil, maltodextrin, sugar, mineral salts [incl. calcium] (332, 229, 340, 504, 509), vitamins (101, 301), water added.

Wt/Vol., Packaging, Price: 250, 500, or 1,000 ml in Combibloc Aseptic carton.
How Stored: Shelf stable.
Nutrition: Water 86.4%, soya extracts 4.1%, vegetable oil 3.5%, maltodextrine 3.3%, sugar syrup 1.7%, mineral salts and vitamins. Percentage of RDA per 600 ml: Calcium 700 mg/100%, vitamin B-12 1.8 mcg/90%, riboflavin 1.0 mg/ 65%, iron 3 mg/30%.
New Product–Documentation: Shurtleff & Aoyagi. 1986. Soymilk Industry and Market, Update. This company makes its own brand, which is economically priced. Label (photocopy). 1987, undated. "The non-dairy soy drink. Cholesterol free. Lactose free. Long lasting." Manufacturer's catalog. 1989. "Juices and Drinks: The newest introduction into this drink category is So Good, a soy-based drink which is designed as an alternative to milk. This is particularly popular with those who have a lactose sensitivity and a need to reduce the cholesterol intake. It is made to a Sanitarium-inspired formula from soy isolate (the protein component in the soya bean) and has the distinct advantage of having a calcium level equivalent to that of cow's milk."

The Supermarket Circle. 1988. "So Good was awarded a 'Golden Sial' award or 'Food Oscar' at the AIDA-SIAL '88 International Oscars, judged in Paris on June 10. The Oscars is a bi-annual competition between 16 nations, including Canada, Great Britain, Italy and the USA. Each country presents products in 7 food and beverage categories: Grocery, alcoholic drinks, non-alcoholic drinks, dairy, deep-frozen, meat/poultry and delicatessen.

"The retail trade in each country nominates the representative products. With outstanding sales success since its launch by Sanitarium in 1987, Australia's retailers nominated So Good to represent the country in the 'non-alcoholic drinks' category."

Alfa-Laval. 1988, June. Soyfoods: Old traditions with new potentials. p. 9. A color illustration on the front of the package shows a glass of soymilk by a bowl or cereal on a table in front of a window facing a stylized rural landscape with the sun rising behind rolling hills. Green, blue, brown, and white. Subtitle: "The non-dairy soy drink. Cholesterol-free. Lactose-free. Long lasting."

Technique Laitiere & Marketing. 1988. No. 1034. Nov. p. 61. Gives nutritional composition. p. 65 So Good is an Australian soymilk product which won the 1988 SIAL gold medal (SIAL d'Or 88). SIAL is the International Food and Dairy Exhibition in Paris.

Sanco News. 1988. Dec. "Now the world thinks we're as good as gold: The Gold Food Oscar for So Good."

Talk with Eric C. Fehlberg, director International Health Food Assoc. 1990. March 7. So Good has had remarkable success in the past few years. Sanitarium Food Co. was the first to make soymilk in Australia. It caught on rapidly, and soon prompted 4-5 competing brands to be launched, but none of them have sales nearly as large as So Good. The main problem has been the company's inability to produce enough to keep up with demand. It was launched in April 1987. In Oct. 1989 they sold 1,738 long tons (2,240 lb/ton). The equipment used to produce the soymilk is Adventist technology, not that purchased from Alfa-Laval, STS, etc. Originally the product was packed under contract by a nearby dairy company in Combibloc cartons. After a year or so they purchased their own Combibloc packaging machine. Sanitarium Foods has a very strong research lab.

Sanitarium Nutrition Education Service. 1990. April. "So Good." This 4-page leaflet gives a clear explanation of each ingredient used, plus nutritional and other information.

According to competitors, in 1991 Sanitarium's So Good was Australia's leading soymilk product. But the fact that it is made from soy protein isolates rather than whole soybeans is considered a drawback by the natural foods market. Sun Gold is another major soymilk product.

1138. *Soyfoods (ESFA).* 1987. News from the world: Australia. 1(2):26. April. [Eng]
• ***Summary:*** "The word 'milk' associated with soya proteins is not in accordance with the rules of the Codex Alimentarius according to which milk is from bovine origin. Arguing from it, The Australian Dairy Farmers Federation has won its case with the Australian authorities for banning the word 'soybean milk' on packages and advertising. The only concession (?) made to the soyfood producers consists in the utilisation of the expression 'milk imitation'."

1139. **Product Name:** Tofu Supreme.
Manufacturer's Name: Tofu Ice Bean.
Manufacturer's Address: Australia.
Date of Introduction: 1987. April.
New Product–Documentation: Soyfoods (ESFA). 1987. April. p. 28. "Tofu Supreme is a non-dairy dessert made by Tofu Ice Bean of Australia. It contains no butterfat or lactose. This product is representative of several frozen desserts made from Tofu that are entering the marketplace."

1140. *East West.* 1987. Vegemite: Australian miso. May. p. 10.
• ***Summary:*** Developed in Melbourne in 1923, Vegemite is a salty, tangy spread, a concentrated yeast extract, made by the Australian subsidiary of Kraft, Inc. Today Australians consume 5,000 tonnes a year; they spread it on toast, mix it with hot water to make a drink, or add it to stews.

1141. Hesser, J.M. 1987. Uses and functionality of wheat gluten. In: R. Lásztity and F. Békés, eds. 1987. Proceedings of the 3rd International Workshop on Gluten Proteins. xvi + 618 p. See p. 441-55. [4 ref]
• ***Summary:*** Contents: Introduction. Processing (how commercial wheat gluten, gum gluten, and vital wheat

gluten is made and dried). Milling and flour fortification. Bakery products. Breakfast cereals. Meat, fish and poultry products (incl. meatlike products or meat analogs and soy/wheat gluten textured meat extender). Pasta. Cheese analogs and pizza. Nutritional snacks (incl. gluten balls in Europe, vegetarian items in the U.S., Yachi-fu and Yachiyo-fu in Japan, fried gluten items in China, and wafers of 30-45% wheat gluten content in Australia). Breadings, batter mixes, coatings and flavorings (incl. gluten-based HVP). Pet food. Aquaculture. Non-food applications. Modified glutens. Acknowledgement.

"Wheat gluten is the water insoluble complex protein fraction separated from wheat flours. It is, primarily, a mixture of two types of protein from the wheat kernel–glutenin and gliadin. Gliadin is highly extensible, less elastic, soluble in alcohols, low molecular weight (less than 100,000), and has intramolecular bonds. Glutenin is less extensible, highly elastic, insoluble in alcohols, high molecular weight (greater than 100,000), and has intra and intermolecular bonds. These two major protein components of wheat gluten interact in an aqueous system to produce a unique property known as viscoelasticity... The major use of wheat gluten has traditionally been and continues to be in bakery products."

The International Wheat Gluten Association, chartered in 1979, consists of 18 members in 11 countries. The primary objective of the IWGA is to promote the common interests of its members and the general welfare of the international wheat gluten industry. Address: Executive Director, International Wheat Gluten Assoc., 4510 West 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155.

1142. Singh, R.J.; Kollipara, K.P.; Hymowitz, T. 1987. Polyploid complexes of *Glycine tabacina* (Labill.) Benth. and *G. tomentella* Hayata revealed by cytogenetic analysis. *Genome* 29(3):490-97. June. [24 ref]
• ***Summary:*** Glycine species were collected in Australia, Fiji, New Caledonia, Ryukyu Islands (southern Japan), Mariana Islands, Tonga, Taiwan, and Papua New Guinea. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1143. American Soybean Association. 1987. Soya Bluebook '87. St. Louis, Missouri: American Soybean Assoc. 270 p. July. Index (bold face type indicates advertiser). 22 cm.
• ***Summary:*** This is the last issue of the *Soya Bluebook* published by the American Soybean Association.

Contents: Organization: International associations, government trading agencies. Soy Directory: Oil extraction plants/refineries, manufacturers of edible grade soy products & soyfoods, manufacturers of industrial grade soy products. Soybean manufacturing support industries: Category listings, product handling equipment & supplies, soybean processing equipment & supplies, manufacturing services, alphabetical company listings. Marketing & auxiliary services: Marketing services, commercial services & suppliers, exporters of soybeans & soybean products, importers of soybeans & soybean products. Soy statistics: Metric conversions, tables, charts, graphs. Glossary. Standards and Specifications. Indexes: Alphabetical company listings, Soya Bluebook sections and categories, advertisers. Maps.

The section titled "Soy statistics (tables, charts, graphs) (p. 185-244) is a rich source of information, worldwide. Contents: Soybean production–Area planted / harvested and yield: U.S. soybean planting and harvesting dates. U.S. soybean acreage, yield, and production. U.S. soybean planted acreage by state. U.S. soybean harvested acreage by state. U.S. soybean yield by state. U.S. soybean production by state.

U.S. production of major crops: Soybeans, corn, wheat, cotton (graph). U.S. harvested acreage of major crops: soybeans, corn, wheat, cotton (graph). U.S. yield per acre of major crops: Soybeans, corn, wheat, cotton (graph). Argentine soybean area, yield and production by province. Brazilian soybean area, yield and production by state. Canadian soybean production. Canadian soybean production and utilization.

Soybean production by major countries (graph). Share of world soybean production by major countries (graph). World soybean production. Soybean acreage by major countries (graph). Share of world soybean acreage by major countries (graph).

Soybeans and soybean products: supply and disposition: U.S. soybeans: Supply, disposition, acreage / yield and price. U.S. soybean meal and oil: Supply and disposition. Soybean usage in the U.S. (graph). U.S. soybean exports–percent of total usage (graph). Argentine soybeans: Supply and disposition. Argentine soybean meal and oil: Supply and disposition. Brazilian soybeans: Supply and disposition. Brazilian soybean meal and oil: Supply and disposition.

U.S. soybean prices, crop value, farm marketings: Prices of U.S. soybeans: No.1 yellow. Prices of U.S. soybeans: Received by farmers. U.S. soybean price support operations. U.S. soybean crop value. U.S. farm marketings of soybeans.

Soybean processing and products–Processing facilities and product value: U.S. soybean processing plants (map). Value of U.S. soybean products and crush margin.

Meal: U.S. soybean meal: prices paid by farmers. U.S. soybean meal: average wholesale price, decatur. U.S. soybean meal: Beginning stocks, production, exports and domestic disappearance. U.S. oilseed cake and meals: Supply, disposition, and price. World major protein meals: Supply and utilization.

Fat and Oils: World major oilseeds: Supply and utilization. World major vegetable and marine oils: Supply and utilization. Prices of U.S. soybean oil. U.S. soybean oil utilization. U.S. soybean oil value as percent of total soybean value (graph). U.S. soybean oil: supply, disposition, and price. U.S. edible fats and oils: Supply and disapperance.

Exports and imports–U.S. exports of soybeans by month. U.S. soybean exports by port and country of destination. U.S. exports: soybeans by country of destination. U.S. soybean exports by port areas (map). U.S. exports: Soybean oilseed cake and meal by country of destination. U.S. exports: Soybean oil by country of destination. U.S. exports: Soybean oil, P.L. 480, title I and III by country of destination. U.S. exports: Soybean, cottonseed and sunflowerseed oils by country of destination. U.S. exports:soybean and cottonseed oils by year. Brazilian exports of soybeans and products to major countries. Soybean and product exports by major countries (graph). World share of soybean and product exports (graph).

Before page 199 are two fold-out color maps (color coded by county): U.S. soybean production 1985, and U.S. soybean acreage 1985. Two other maps are: American Soybean Association international offices / world regions, U.S. soybean processing plants, and U.S. soybean exports by port areas.

A full-page table (p. 235) shows U.S. exports of whole soybeans, 1982-1986–Volume of exports (in metric tons) by country of destination and total value each year. Region and country of destination: North America: Canada, Mexico, other, total. South America: Brazil, Colombia, Ecuador, Peru, Venezuela, other, total. Europe and Russia: Belgium & Luxembourg, Czechoslovakia, Denmark, France, Germany (West), Germany (East), Greece, Ireland, Italy, Netherlands, Norway, Portugal, Romania, Soviet Union, Spain, Switzerland, United Kingdom, Yugoslavia, other, total. Middle East. Africa. Asia: China–PRC, China–Taiwan, India, Indonesia, Japan, Korea (South), Pakistan, other, total. Australia & Oceania. Other unidentified. Grand total. Value of exports–total (million $). Address: P.O. Box 27300, St. Louis, Missouri 63141.

1144. Kavanagh, John. 1987. ANF [Australian Natural Foods] hopes for a soy cash-cow. ***Business Review Weekly (Sydney, Australia).*** Aug. 21.

• ***Summary:*** This publicly owned biotechnology company was launched two years ago. "Now it appears to be turning back on its high tech potential to enter the cut-throat beverage market... This week ANF launches Excel, Australia's first fresh soymilk product. ANF will produce 100,000 liters/week at its Sydney factory during the initial phase and hopes to take production up to 500,000 liters a week." United Dairies will handle distribution. David Glasheen is working on a number of new soy products including tofu, yogurt, and custard. Most of the soymilk products now available are imported. Sanitarium's So Good, aimed at the mass market, is doing well.

1145. *Australian Dairy Foods.* 1987. Soy competition begins in earnest. Aug. p. 56-57.

• ***Summary:*** "Long expected direct competition to the liquid milk market from liquid soy foods has begun in earnest in Sydney. Australia Natural Foods Holdings Ltd., launched the 'Excel' brand of fresh, non-dairy soy drink on August 19. It is being distributed in New South Wales by United Dairies Ltd., via its 500 milk vendors and 8,000 retail outlets serviced by the company... The recommended retail price is much higher than fresh cow's milk. Both natural and flavoured 'Excel' are $2.99 for a 2-litre plastic bottle that looks like fresh cow's milk, and $1.15 for 500 ml and 66 cents for 300 ml... ANF has a soy bean processing plant at a new factory at Taren Point. It is capable of producing 20 million litres a year of liquid soy food, on a three-shift, five day a week basis. The initial sales target is 100,000 litres a week." The three men who are the prime movers behind ANF are Larry Case (Chairman), David Glasheen, and Peter Lancaster. A photo shows 5 of the products. Excel is available in natural, chocolate, and strawberry flavors. Address: P.O. Box 283, Caulfield South 3162, VIC, Australia.

1146. **Product Name:** Excel (Fresh Soymilk) [Natural, Chocolate, or Strawberry].
Manufacturer's Name: Australian Natural Foods Holdings Ltd. (ANF).
Manufacturer's Address: 80 Box Rd., Taren Point, NSW 2229, Australia. Phone: 2-526-2555 or 525-5406.
Date of Introduction: 1987. August.
Wt/Vol., Packaging, Price: 500 ml or 2 liter bottle.
How Stored: Refrigerated.
New Product–Documentation: Kavanagh. 1987. Business Review Weekly. Aug. 21. "ANF hopes for a soy cash-cow." Geoff Wilson. 1987. Australian Dairy Foods. Aug. p. 56-57. The product was launched on Aug. 19. It is being distributed in New South Wales by United Dairies Ltd. via its 500 milk vendors and 8,000 retail outlets serviced by the company. Both natural and flavored Excel are much more expensive than cow's milk, $2.99 for a 2-liter bottle, and $1.15 for 500 ml. ANF has a soybean processing plant at a new factory at Taren Point. It is capable of producing 20 million liters a year. The initial sales target is 100,000 liters/ week. The company claims that its soymilk production technology was developed exclusively by ANF. The moving forces behind the company are Mr. Larry Case (Chairman), David Glasheen, and Peter Lancester. The product is promoted as being fresh, not being in Tetra Pak cartons. Taren Point is a suburb of Sydney.

1147. *J. of the American Oil Chemists' Soc.* 1987. World fats & oils report: Higher oil prices predicted. 64(8):1058-59, 1062, 1064, 1066-78, 1080-85. Aug. [1 ref]

• ***Summary:*** Statistics and general information on vegetable oil production, consumption, and trends in the following countries is given: Australia, Austria, Brazil, Canada, China, Czechoslovakia, Egypt, Finland, France, West Germany, East Germany, Hungary, India, Indonesia, Italy, Ivory Coast, Japan, Korea, Malaysia, Mexico, the Netherlands, Nigeria, Norway, Pakistan, Peru, the Philippines, Poland, Soviet Union, Spain, Sweden, Turkey, Uruguay, Venezuela, and Yugoslavia.

Tables include: 1. World production and consumption of major vegetable and marine oils. 2. Top 10 producers of major vegetable oils (USA, EEC 12 countries, Malaysia, China, Brazil, USSR, Indonesia, East Europe, Argentina, India. The oils: soybean, cottonseed, sunflowerseed, rapeseed, coconut, palm kernel, and palm oil). 3. Top 8 exporters of major edible oils (Malaysia, EEC 12 countries, Argentina, Philippines, USA, Singapore, Brazil, Indonesia). 4. Top 8 importers of major edible oils (EEC 12 countries, Africa, India, USA, Singapore, USSR, China, Pakistan). 5. Margarine, compound fat/shortening, and salad oil production for selected countries (USA, USSR, Japan, India, Pakistan, Netherlands, West Germany, UK, Canada, Poland, Brazil).

1148. Keith L. Lippert Assocs. 1987. Tofutti Brands Inc. enters Australia via licensing agreement with Zabbar Pty. Ltd (News release). 136 East 57th St., New York, NY 10022. 1 p. Oct. 2.

• ***Summary:*** Zabbar signed a licensing agreement to become the exclusive manufacturer and distributor of Tofutti nondairy frozen desserts in Australia. This is part of Tofutti Brands' expansion into overseas markets. Address: New York.

1149. Dagnoli, Judann. 1987. Tofutti spreads reach into Canada, Australia. Finland is next target. *Advertising Age.* Oct. 19.

• ***Summary:*** According to Steven Kass, chief financial officer, Zabbar Pty Ltd. is the Tofutti distributor in Australia, and Aur-Mark Holdings is the master developer and distributor in Canada. Canada has high per capita consumption of ice cream. New products include Tofutti Frutti (frozen dessert on a stick), Better than Cheesecake (cheeseless cheesecake), and Egg Watchers. They are trying to expand into areas besides dessert. The northeast is Tofutti's strongest market both because of its high per capita consumption of ice cream and its high percentage of Jewish population who keep kosher. In the U.S. Ketchum/Hicks & Greist, New York, handles Tofutti Brands' estimated $3 million ad budget. Kass said that drop in 1986 sales was due mainly to increasing competition in the crowded frozen novelty category. Address: Chicago, Illinois.

1150. Cole, Michael. 1987. Soya International Limited (News release). Downs Court, 29 The Downs, Altrincham, Cheshire WA14 2QD, England. 2 p. Oct.

• ***Summary:*** Cole was the founder (in 1984) and previously managing director of Soya Health Foods Ltd. Soya International Ltd. is an international soya marketing company, with an international database containing information related to soya products. Stephen Burgess is the company's computer consultant. "This information centre fully computerized and the first of its kind serves to support the main activities of the company whose sub-heading is "Research, Development, Marketing, and Management Consultants." S.I. Ltd. has already joined with the large Italian company Sordi S.p.A. (a supplier of dairy and juice equipment) to complete a feasibility study for the Argentine government, as well as working with both the Brazilian and New Zealand governments on far reaching long term soya projects. Cole, age 42 and born in London, is a vegetarian. He managed to bring Soya Health Foods Ltd.'s Sunrise brand products to the position of market leaders in just 2 years.

Note: In Feb. 1989 a letter sent to this company was returned. His phone was no longer in service, and the directory assistance operator in England could find no new listing in Altrincham or in the Cheshire County or Manchester areas. Address: Cheshire, England. Phone: 061-926-8019.

1151. Pandey, R.K.; Sumarno, -; Potan, Nark; Navarro, R.; Dharmasena, C.; Beg, Akhtar. 1987. Asia's shortfall in production of soybeans and the response of national programmes. In: S.R. Singh, K.O. Rachie, and K.E. Dashiell. eds. 1987. Soybeans for the Tropics. New York: John Wiley & Sons. xx + 230 p. See p. 101-09.

• ***Summary:*** Contents: Introduction. Constraints. National research programmes: Varietal improvement, cultural practices. Cooperative research: A new dimension.

Demand for soybeans and products in the region is about twice the regional production. By the year 2000, if current trends continue, Asia's demand for soybeans is projected to be more than three times the amount produced.

The leading soybean producers in Asia, in descending order of tonnes produced in 1983, are China, India, Indonesia, Korea, and Thailand. In Indonesia, soybean production during the past 10 years has been constant at about 700,000 tonnes (metric tons) per year; soybeans are produced mainly in Java.

In 1984 Thailand produced 284,000 tonnes, which was far below its demand of about 350,000 to 450,000 tonnes. A national program set a goal of producing 390,000 tonnes by 1986.

In the Philippines, Mindanao, located in the south, is the leading soybean producer. During the last 10 years, producing has gradually increased, however in 1983 only 8,320 ha were planted to soybeans; that year, imports totaled 261,000 tonnes of soybean meal and 31,000 tonne of whole soybeans.

In Pakistan, commercial soybean production began in 1970 and is concentrated in the North Frontier Province, Sind and Punjab. The area planted to soybeans is small (4,300 ha) but the potential for expansion is very large.

Vietnam produces only about 1% of Asia's soybeans, however the amount is increasing.

The following countries started research programs on soybean breeding and production at an early date: China, Indonesia, Thailand, India, Philippines, Korea, and Sri Lanka; these programs have made great progress during the past few years. China has large and well-run germplasm collections.

Since 1967, the Indian Council on Agricultural Research has had an interdisciplinary team working on soybeans. The project's headquarters are currently at Pantnagar, and a network of 19 centers throughout India tests varieties and production techniques.

In Indonesia, soybean research is coordinated by the Central Research Institute for Food Crops in Bogor, and conducted by five research institutions.

In Thailand, soybean research is coordinated by the Field Crop Research Center at Chiangmai.

In Sri Lanka, in 1973, the government initiated soybean research, with technical assistance from the International Soybean Program (INTSOY), to promote soybean production and utilization in the country.

In 1984 the Asian Soybean Improvement Network (ASIN) was launched in a cooperative effort to extend the resources devoted to research by national programs, IITA, IRRI, AVRDC, INTSOY, the Australian Centre for International Agricultural Research (ACIAR), and the United Nations Economic and Social Council for Asia and the Pacific. The network is coordinated by representatives of AVRDC and IITA.

Figures show: (1) Pie charts–Asia's proportion of world area and production of soybeans. Concerning world production, Asia has about 15.7% of the total, compared with 57.3% for North and Central America, 24.6% for South America, and 2.4% for others. Within Asia, China has 79.1% of Asia's total soybean production, followed by India (5.9%), Indonesia (4.5%), Korea (3.0%), Others (incl. Japan; 7.2%).

(2) Pie charts–Trade in soybeans, soybean meal and oil in Asia and the world. For soybean oil imports, Asia is the leader (37.9% of the world total), followed by Europe (24.5%), Africa (13.9%), South America (12.5%) ad Others (9.2%). For soymeal imports, Europe is the leader (73.0% of the world total), followed by USSR (10.2%), Asia (8.2%), and Others (8.6%). For whole soybean imports, Europe is the leader (58.0% of the world total), followed by Asia (30.6%), North & Central America (6.4%), USSR (5.0%), and Others (0.0%). Within Asia, for soybean oil imports, India is the leader (36.4%), followed by Iran (22.9%), Pakistan (19.3%), Turkey (6.4%), Bangladesh (3.57%), and Others (11.4%). For soymeal imports, Korea is the leader (15.2%), followed by Philippines (14.7%), Iran (12.9%), Japan (12.5%), Thailand (10.0%), Malaysia (8.0%), Others (26.7%). For whole soybean imports, Japan is the leader (61.2%), followed by China (17.5%), Korea (6.6%), Israel (6.6%), Indonesia (2.7%), and Others (3.9%).

(3) Changes in the area planted to soybean over the past 15 years (1965-1983) in selected Asian countries. Graphs of India, Thailand, Indonesia (which have increased, with India's graph increasing dramatically), Asia, China, and Korea (which have decreased somewhat).

(4) Soybean production, consumption, and projected demand in Asia by the year 2000 (Source FAO, 1960-83; IFPRI, 1977). Asia will have to steadily increase its imports of edible oils, since consumption (production + imports) of soybeans is falling behind demand. Address: 1. International Rice Research Inst., Los Baños, Philippines; 2. Central Research Inst. for Agriculture (Lembaga Pusat Penelitian Pertanian), Bogor, Indonesia; 3. Field Crops Research Inst., Dep. of Agriculture, Bangkhen, Bangkok, Thailand. 4. Inst. of Plant Breeding, Univ. of the Philippines, Los Baños, Philippines. 5. Soybean Project, Peradeniya, Sri Lanka. 6. Agricultural Research Council, Islamabad, Pakistan.

1152. Hymowitz, T. 1987. Present research on soybeans (Interview). *SoyaScan Notes.* Nov. 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** 1. Plate tectonics: The distribution of the genus follows the plates. The wild Glycine is not found east of the Andesite line. This research aims to show the ancient place of origin of the soybean before domestication. Lots of field research is involved, collecting in Oceania and Southeast Asia, plus study of botanical literature. Plans to collect in Taiwan and the Ryukyus. 2. Dissemination of the soybean in Illinois after its introduction by Dr. Benjamin Franklin Edwards. 3. Trading between Sweden and China in early days. Address: Dep. of Agronomy, Univ. of Illinois.

1153. **Product Name:** Miso Mustard.
Manufacturer's Name: Kaiora Natural Ltd.
Manufacturer's Address: CPO Box 3007 (180 Victoria St. West), Auckland 1, New Zealand. Phone: 09-370 454.
Date of Introduction: 1987. November.
Ingredients: Mustard seeds, brown rice vinegar, barley miso (soybeans, barley, water, sea salt).
Wt/Vol., Packaging, Price: 200 gm.
How Stored: Shelf stable.

New Product–Documentation: Label. 1987. 7.5 x 2 inches. Purple, light purple black, white, green, and red. "A rich, rounded blend of premium stoneground mustards and nutritious barley miso. Miso mustard is preferred for its superior flavor and mellow character." Note: Kaiora also markets apple butter, almond butter, peanut butter, apple & blackberry conserve, apple & strawberry conserve, vanilla extract, hazlemalt spread, and unrefined olive oil. Beautiful labels! Form filled out by Austin Holden. 1988. Dec. Gives date of introduction.

1154. *APV News.* 1987. APV Global emphasis for group structure: Centres of excellence. Dec.
• ***Summary:*** There is a new corporate headquarter in London–APC plc, Lygon Place, Ebury Street, London SW1W 0RJ. Instead of over 200 registered subsidiaries in future there will be less than a dozen primary subsidiaries, about ten secondary subsidiaries and a number of sales subsidiaries. The APV Group incorporates Baker, Perkins and Pasilac. The parent company has a new name–APV plc. Business in the food and beverage industries remains at about 70% of turnover. Dairy is 25% of total sales; bakery and confectionery, 20%; beverages, 15%; other food, 10%; printing, 10%; pharmaceutical and chemical, 10%; industrial, 10%. And world sales by location of customer are satisfactory with continental Europe at 30%; America 30%; UK at 20%; Asia/Australasia at 15%; Africa at 5%.

1155. Hill, D. 1987. Australian College of Paediatrics policy statement on soy protein formula (letter). *Australian Paediatric Journal* 23(6):367-68. Dec. [4 ref]
• ***Summary:*** Contrary to the general impression conveyed by the Policy Statement, there is good evidence that casein hydrolysate preparations are also antigenic and allergenic. "Indeed data quoted from this laboratory by the Committee showed that 20% of the children with cow's milk allergy who were tried on casein hydrolysate preparations were intolerant to them, compared with nearly 50% of the children tried on soy formula with cow's milk allergy who became intolerant of the soy products." Address: Head, Allergy-Clinical Immunology Unit, Royal Children's Hospital, Parkville, Victoria 3052, Australia.

1156. **Product Name:** Tempeh.
Manufacturer's Name: Southern Soy.
Manufacturer's Address: P.O. Box 22.471, Christchurch, New Zealand. Phone: 810-736.
Date of Introduction: 1987. December.
Ingredients: Soybeans, water, rhizopus.
New Product–Documentation: Talk with Seth Tibbott. 1990. Aug. 15. Seth visited Nigel Harris, the owner, in New Zealand in Dec. 1987. He made tempeh at that time, and perhaps tofu. Seth has a label for his tempeh. Note: A letter written to this company at the above address in Feb. 1992 was returned. Nor did Christchurch telephone directory assistance have any listing for the company. Seth Tibbott does not have a more current address.

1157. Tofutti Brands Inc. 1987. Tofutti. Annual report. Rahway, New Jersey. 14 p. Dec.
• ***Summary:*** The fiscal year ended January 2, 1988. Net sales for the 53 week period were $7,705518 versus $11,602,910 for the 52 week period ending August 2, 1986. The Company's operating loss was $2,560,645 as compared to an operating loss of $1,384,156 for the fiscal year ended August 2, 1986. The most important problem faced by Tofutti Brands last year was the rebuilding of its national distribution. The Company's first international license agreement was signed in June 1987 with Aur-Mark Holdings Co. Ltd. of Toronto, Canada, for the manufacture and sale of Tofutti Brand nondairy frozen desserts in Canada. The Company also signed an agreement in September 1987 with Zabbar Pty. Ltd., an Australian company, for the manufacture and sale of Tofutti Brand nondairy frozen desserts in Australia. The Company's first franchise shop in Teaneck, New Jersey was opened for business on March 3, 1987. The Company acquired the Tofutti Franchise Shop in Teaneck during October 1987. The Company-owned shop in Carteret, New Jersey was closed in January 1987.

David Mintz owns 50.8% of the Common Stock while Francis I. Mullin, III (President and Chief Operating Officer since August 1986) owns 2.2%. They are the biggest stockholders in the company. Mullin received $221,173 in cash compensation, while Mintz received $102,923. The Company entered into a 3-year employment agreement with Mr. Mullin commencing on August 18, 1986, in which he will receive an annual base salary of not less than $217,000. Mullin will also receive an annual bonus equal to a percentage of the increase, if any, in net sales and net income of the Company. Address: 1098 Randolph Ave., Rahway, New Jersey 07065.

1158. **Product Name:** Healtheries Dietex Low Sodium Soy Mayonnaise.
Manufacturer's Name: Healtheries of New Zealand Ltd.
Manufacturer's Address: 47-51 Wilkinson Rd., Auckland 5, New Zealand.
Date of Introduction: 1987.
Ingredients: Water, cold pressed soybean oil, cider vinegar, apple juice concentrate, unsalted egg yolk, lemon juice concentrate, thickeners (locust bean gum, xanthan gum), herbs, spices.
Wt/Vol., Packaging, Price: 375 ml wide mouth glass jar.
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 100 gm: Calories 310, protein 1.0 gm, fat 32.0 gm, carbohydrate 5.7 gm, sodium 12 mg, potassium 113 mg.

New Product–Documentation: Label. 1987, undated. "Food for Specific Dietary Use. No Added Salt or Preservatives." Australian Distributors: Health Minders Pty Ltd., 5 Marshall Rd., Kirrawee, Sydney.

1159. **Product Name:** Shoyu (Naturally Brewed Soy Sauce), Organic Shoyu, Traditionally Brewed Tamari (Wheat Free Soy Sauce), Organic Tamari, and Tamari Teriyaki.
Manufacturer's Name: Kaiora Natural Ltd. (Importer). Made in Japan.
Manufacturer's Address: CPO Box 3007 (180 Victoria St. West), Auckland 1, New Zealand. Phone: 09-370 454.
Date of Introduction: 1987.
New Product–Documentation: 1. Shoyu (naturally brewed soy sauce): Made by Sendai Miso Shoyu Co. in Japan. The moromi mash is left to mature in huge cedar wood casks at ambient temperatures for up to 2 years. 300 ml and 750 ml. Labels are light and dark purple. 2. Organic shoyu: "Produced exclusively by a religious community in Japan... The community farms its own organically grown soybeans and wheat in Hokkaido." 150 ml and 750 ml. Labels are light and dark red. 3. Traditionally brewed tamari: Brewed by the San Jirushi Company of Japan. Matures for over one year in cedar kegs. 150 ml, 300 ml, and 750 ml. Labels are light and dark green. Salt content: 14.2%. 4. Organic tamari: Brewed by the Mansan Company of Japan. It is made in the traditional manner, maturing for over 1 year in cedar kegs. Labels are light and dark tan. 150 ml and 750 ml. Contains natural mirin. Salt content: 14.2%. 5. Tamari teriyaki. Made by San Jirushi. 300 ml. Label is brown and gold. Contains tamari, rice vinegar, mirin, honey, miso, ginger, garlic, spices. No preservatives or additives. Labels sent 1988. Dec. by Austin Holden.

1160. Tindale, Mary D. 1987. Taxonomic notes on three Australian and Norfolk Island species of *Glycine* Willd. (Fabaceae: Phaseolae), including the choice of a neotype for *G. clandestina* Wendl. *Brunonia* 9:179-91. [4 ref]
• ***Summary:*** Describes *Glycine arenaria* Tind. Prior to this, the only *Glycine* species known to occur in north-western Australia were *G. tomentella* Hayata, which occurred from Taiwan to northern New South Wales in Australia, and *Glycine falcata* Benth. from the Northern Territory and Queensland. Address: Royal Botanic Gardens, Mrs. Macquarie's Rd., Sydney, N.S.W. 2000, Australia.

1161. Bartholomai, Alfred. ed. 1987. Food factories: Processes, equipment, costs. Weinheim, West Germany: VCH Verlagsgesellschaft mbH. xv + 289 p. 24 cm. [Eng]
• ***Summary:*** Includes chapters on tofu plant by Takai Tofu & Soymilk Equipment Co. (Japan) (p. 157-59, Chap 22), surimi plant by K.L. Holmes and C. Riley (p. 207-14), protein recovery plant by J. Lyle (p. 223-27), soybean oil extraction plant by K. Weber (p. 231-35), and soymilk plant by Takai Tofu & Soymilk Equipment Co. (Japan) (p. 279-81, Chap. 41).

Within each chapter are the following sections: Introduction, economic considerations, social impact, plant design basis (capacity), plant layout and floor plan, process description. Takai has recently supplied/sold the following plants: (1) Tofu plants to Natural Inc. (Maryland, USA 30 kg/hour), Tempe Production BV (Netherlands, 30 kg/hour), and Castle Trading (Australia, 60 kg/hour). (2) Soymilk plants to Namyang Company (Korea, 2,000 liters/hour), Seoju Industrial Company (Korea, 1,000 liters/hour), Guilin Sweets and Food Factory (China, 1,000 liters/hour), Jinan Soymilk Factory (China, 1,000 liters/hour). Address: 570 Stanhope Rd., Sparta, New Jersey, 07871.

1162. Cribb, A.B.; and Cribb, J.W. 1987. Wild food in Australia. 2nd ed. Sydney, Australia: William Collins Publishers. 240 p. 23 cm. *
• ***Summary:*** The taproot of this wild perennial relative of the soybean is reported to have the flavor of licorice, and to have been chewed by Aborigines in Australia.

1163. Downes, John. 1987. Soy source: A practical guide to cooking with soy foods. Chatswood, NSW, Australia: Nature and Health Books. Co-published in 1987 by Prism Press, 2 South Street, Bridport, Dorset DT6 3NQ, England. Distributed in the USA by Avery Publishing Group. 127 p. No index. 22 cm. [21 ref]
• ***Summary:*** Contents: Introduction, Nutrition & Soyfoods, Ingredients & Techniques, Glossary, Appetizers & Dips, Marinades & Accompaniments, Soups, Soup Noodles, Main Courses, Salads & Dressings, Desserts, Bibliography. A cookbook containing very little information about soyfoods in Australia. The author was born in 1949. Address: Australia.

1164. Harrison, P.G. 1987. Soybeans in tropical Australia: Some seed quality aspects. [Darwin?]: Northern Territory, Dept. of Industries and Development. 18 p. Illust. 30 cm. Technical Bulletin No. 108. [15+ ref]*

1165. Wilson, Geoff. 1988. Re: Proposed newsletter on soy in Australia. Letter to William Shurtleff at Soyfoods Center, Jan. 11. 1 p.
• ***Summary:*** Wilson, editor of Australian Dairy Foods and several other magazines, has written widely on soyfoods in that country. He feels they have great potential and may be a threat to dairy products. His proposed newsletter on soy could be launched during the second half of 1988. He would like to visit Soyfoods Center this June. Address: P.O. Box 283, Caulfield South 3162, Victoria, Australia. Phone: 03-211-6209 or 6475.

1166. Roller, Ron. 1988. Edensoy and the U.S. soymilk market (Interview). *SoyaScan Notes.* Feb. 23. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ron estimates the size of the U.S. soymilk market to be about 2.1 million gallons a year (not including infant formulas, or small fresh local manufacturers). The largest companies, in descending order of size, are: American Soy Products (Eden Foods; 55-65% market share), Vitasoy, Sunsoy, Westbrae, and Great Eastern Sun. The trend is definitely up. Vitasoy's aggressiveness in the marketplace from early 1987 slowed down Edensoy's progress. Then Vitasoy had big programs and in the last 4 months they seem to have cooled out quite a bit. A Dun & Bradstreet report shows that they lost $700,000 last year selling soymilk.

All is going very well in the joint venture with the various Japanese companies. The relationships are generally harmonious, and they are on target in terms of their volume goals and expectations. They hope to increase volume to cut down overhead expenses. The plant can make 65-70,000 cases/month. During the last 2 months there have been 15 enquiries for export, some of which will soon be signed agreements with France, New Zealand, Australia, etc. They have approval for 190 Kroger stores and are cautiously optimistic on this. Mr. Iwazuki from Marusan runs the ASP plant. They now have 6 soymilk products which are Eden Foods' top six best-sellers: three flavors (carob, vanilla, original) in two sizes (liter and 250 ml). By volume, the liter outsells the 250 ml by more than 3 to 1. Next: an organic soymilk (They now use non-organic Beeson soybeans. The organic market now seems to be growing rapidly), some new flavors, and some totally new soy products, such as tofu. Eden no longer imports soymilk. Soymilk is pretty price sensitive; whenever they put it on sale, it moves. They just started a case-stack program that Sunsoy has had for years. When they started the plant they stopped wholesaling, and dropped over $1 million of wholesale business. But they made that up this past year, plus some.

Concerning oil in soymilk: The label on their Japanese imported product was not correct. Oil was added in Japan but Eden was not told. It was not listed on the label. When their U.S. product was launched, it contained less than 1% added oil. Eden got so many complaints about this small amount that they now no longer add oil, except to the carob, and that will be discontinued as soon as their present labels are reprinted.

Concerning other grains, they are importing Job's tears, which is now recommended by macro teachers for cancer patients. They brought the price from $8.50 down to $2.00/lb and sell lots. Also involved with quinoa, they used to be the master distributor for Quinoa Corp. but are now importing lots from Andean countries; expect to reduce the retail price by 40%. They are thinking of using quinoa in soymilk. Their present sweetener is "malted cereal sweetener" which is made by mixing sprouted barley with corn grits, the adjunct. Rice is too expensive. You can get a higher sugar content with corn than with barley. Rice is still higher in sugar. Corn converts the fastest; rice is slow. It is specially made by a malting house, and they use almost a tanker load every 10 days. They helped develop the product and intend to come out with a line of malted grain sweeteners using malted barley plus different grains. "There is a lot of funny business in the malting arena." They did not like the use of commercial enzymes by California Natural Products. He thinks most people do not realize how their rice syrup is made. Address: Director of Purchasing, Eden Foods, Clinton, Michigan.

1167. Acker, Duane. 1988. Aid, USAID, and U.S. agriculture. *International Agriculture Newsletter (Univ. of Illinois)* No. 117. p. 1-3. Feb.

• ***Summary:*** U.S. technical assistance projects did not cause the sharp drop in exports of U.S. commodities experienced since 1981. Factors that did contribute to the decline include: the prolonged high value of the dollar; reduced economic growth; the heavy debt load of low and middle income countries; an increase in agricultural production from 18 to 60% since 1975 in Argentina, Australia, Canada, China, and the European Economic Community (EEC); high farm subsidies in EEC countries; pricing U.S. grain above world levels; and import duties and other constraints.

There are five principles that apply to the development of Third World countries: (1) Poor people and poor countries do not buy much. (2) Strengthening and increasing the productivity of that part of the private sector that employs the most workers in a developing country will usually produce the most rapid economic growth. (3) improved nutrition improves productivity. (4) As income goes up diets diversify. With higher incomes, people want a better diet which is often reflected in the demand for meat. (5) As economics develop, countries increase both imports and exports. Exports are essential to help finance imports.

Developing countries that increased per capita food production the most rapidly also increased their imports of U.S. agricultural products most rapidly.

USAID, allied to the U.S. State Department, celebrated its 25th anniversary in 1986. Address: Director for Food and Agriculture, U.S. Agency for International Development (USAID).

1168. Price, T.V. 1988. Seed sprout consumption for human consumption–A review. *Canadian Institute of Food Science and Technology Journal* 21(1):57-65. Feb. [77 ref]

• ***Summary:*** Contents: Abstract. Introduction. Economic importance. Nutritive value of sprouts. Principles of sprout production: Seed source, seed germination, duration of seed soak and temperature of soak water, watering regime, frequency, duration and water temperature, gaseous exchange, room temperature and humidity, light, hormones, growth regulators, harvest time, post-harvest treatment, post-harvest storage, packaging, bottling and canning, microbial and toxicological factors. Conclusions. Acknowledgements.

"Germinated mung beans *(Vigna radiata* L.) are the oldest and best known of all sprouts and have been used as food by the Chinese for nearly 5,000 years." Address: School of Agriculture, La Trobe Univ., Bundoora, Victoria 3083, Australia.

1169. Sutardi, -; Buckle, K.A. 1988. Characterization of extra- and intracellular phytases from *Rhizopus oligosporus* used in tempeh production. *International J. of Food Microbiology* 6(1):67-79. Feb. [18 ref]
• ***Summary:*** This Rhizopus mold produced both extra- and intracellular phytases. The enzymes were isolated, partially purified, then characterized. Address: Dep. of Food Science & Technology, Univ. of New South Wales, P.O. Box 1, Kensignton, NSW 2033, Australia.

1170. Golbitz, Peter. 1988. Long life tofu: Wave of the future? *Soya Newsletter (Bar Harbor, Maine).* March/April. p. 7, 12.
• ***Summary:*** Morinaga Nutritional Foods, Inc., Los Angeles, California, and Kikkoman International Inc. of San Francisco, California, are both marketing long-life tofu, produced in Japan exclusively for export to the U.S. and other countries. (A Japanese governmental agency has forbidden the companies to market these products in Japan for fear that they threaten the existence of the fresh tofu industry, which consists of at least 30,000, small and localized, tofu shops.)

Kikkoman's product, Kikkoman Tofu, is also produced using a patented, though different process, packed in a foil retort pack. The product is produced by Kikkoman Corporation, at their Noda, Japan plant. The principle behind both products is really very simple. Cooled liquid soymilk is mixed with a heat reactive coagulant, packaged in a container, heated to activate the coagulant and then cooled. The major difference between Kikkoman's and Morinaga's product is when and where the sterilization of the package and product occurs.

Morinaga's process consists of: sterilizing the soymilk with UHT processing, cooling, adding coagulants glucono delta-lactone (GDL) and calcium chloride, filling into a sterile Tetra Pak, sealing, heating the package with water just hot enough to activate the GDL, and then cooling.

With the Kikkoman Tofu, the sterilization of the product is achieved after packaging. Coagulants GDL and calcium chloride are added. It is then filled into a retort pack, sealed, and heated at temperatures high enough to activate the coagulant and sterilize the finished product. Both the Kikkoman and the Morinaga tofus tend to be slightly more expensive than regular tofu. Silken (unpressed) tofu is unfamiliar in the U.S., and no company has yet come out with a pressed tofu that doesn't require any refrigeration.

Sales of Mori-Nu are up between 40 and 50% over last year, and unit sales of the product put Morinaga among the top five tofu companies in the U.S. Kikkoman's product has been on the market for more than a year and is also reportedly making healthy sales gains. Morinaga's product is currently being shipped to 36 countries world-wide, with the U.S. being the largest consumer by far. Kikkoman also reports that they are shipping their product to Europe, Australia and Canada, but again, the biggest volume is in the U.S. Address: Soyatech, Bar Harbor, Maine.

1171. Singh, R.J.; Kollipara, K.P.; Hymowitz, T. 1988. Further data on the genomic relationships among the wild perennial species (2n = 40) of the genus *Glycine* Willd. *Genome* 30(2):166-76. April. [53 ref]
• ***Summary:*** The genus *Glycine* Willd. is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The subgenus contains 15 wild perennial species. The authors propose the genome symbol GG for both *Glycine max* and *Glycine soja.* Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1172. *Graphic (Brooklyn, New York).* 1988. The "scoop" on David Mintz, the father of Tofutti. May 25.
• ***Summary:*** David Mintz, a successful kosher caterer from Brooklyn, never believed tofu could change his life, but it has. In 1972, while searching for a milk substitute for kosher desserts, pastries, pies and sauces, he discovered tofu. In 1981, he introduced Tofutti ice cream to the world. More than 38,000 outlets in all 50 states–including supermarkets, health food stores, groceries, gourmet shops and department stores–carry the product. Tofutti is also available in Canada, Japan, Australia, Korea, Hong Kong, and the U.S. Virgin Islands.

1173. Wall, Richard. 1988. UT [Univ. of Tennessee] holds new era for agribusiness. *East Tennessee Business Journal (Knoxville, Tennessee).* July 25.
• ***Summary:*** Professor Dr. Peter M. Gresshoff, Racheff Chair of Excellence at the University of Tennessee, is not only pioneering plant molecular genetic applications that will dramatically change agriculture, he's also developed a unique plan to interface this and other scientific efforts with the business community. By genetically altering the soybean the Australian scholar claims that he can eliminate the need for fertilizer by establishing an optimum symbiotic interaction between the plant and the soil, while maintaining the same production levels. About $4,300 million was spent in this country last year on biotechnology. Gresshoff's "super-nodulating" soybean would not only require no

application of fertilizer for itself, it would create enough nitrogen in the soil for the next crop, say corn.

1174. **Product Name:** Pureharvest Soy Drink [Natural, or Vanilla].
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor). Made in Japan.
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1988. July.
Wt/Vol., Packaging, Price: 1 liter Tetra Brik carton.
How Stored: Shelf stable.
New Product–Documentation: Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In July 1988 they introduced their first soymilk in a 1 liter Tetra Pak carton, made by and imported from Kibun in Japan, in natural and vanilla flavours.

1175. Mitchell, David A.; Doelle, H.W.; Greenfield, P.F. 1988. Agar plate growth studies of *Rhizopus oligosporus* and *Aspergillus oryzae* to determine their suitability for solid-state fermentation. *Applied Microbiology and Biotechnology* 28(6):598-602. July. [14 ref]
• ***Summary:*** Both organisms grew well on cassava starch as their sole source of carbon and energy, although growth was stimulated by addition of yeast extract and peptone. Neither organism utilized ungelatinized starch effectively. Growth of *R. oligosporus* was inhibited by NaCl (table salt) at greater than 0.5% (w/v), while A. oryzae was unaffected by up to 4% NaCl. Colony radial growth rate for R. oligosporus was far superior to that obtained for A. oryzae. R. oligosporus was chosen as the more suitable organism for future studies of protein enrichment of cassava by solid-state fermentation. (A further advantage of R. oligosporus is that it has been consumed as a food, in the form of tempeh for centuries, showing its acceptability and safety.). Address: Biotechnology Unit, Univ. of Queensland, St. Lucia, QLD 4067, Australia.

1176. **Product Name:** Organic Nigari Tofu, Organic Smoked Tofu, Tofu Mayonnaise, Tofu Burger.
Manufacturer's Name: Kaiora Natural Ltd.
Manufacturer's Address: CPO Box 3007 (180 Victoria St. West), Auckland 1, New Zealand. Phone: (09) 370 454.
Date of Introduction: 1988. August.
New Product–Documentation: Letter from Austin Holden. 1988. Dec. This August they began to produce a wider range of soy products. They use locally grown organically certified soybeans ("Biogro" certified by IFOAM), Japanese nigari, Artesian well water. The organic smoked tofu is solidified with calcium sulfate. The standard block is sliced in two in the horizontal plane and then woodsmoked with Manuka, a variety of native tree wood. This is the wood traditionally used to smoke fish in New Zealand.

Tofu Mayonnaise contains unrefined rapeseed (Canola) oil, organic tofu, organic rice malt, organic lemon juice, organic brown rice vinegar, sea salt, spices, and vegetable gums. It is packed in glass. Tofu is sold in bulk and vacuum packed trays. Smoked tofu is vacuum packed. Burgers are sold only through the company's retail store at present.

1177. **Product Name:** Organic Tempeh.
Manufacturer's Name: Kaiora Natural Ltd.
Manufacturer's Address: CPO Box 3007 (180 Victoria St. West), Auckland 1, New Zealand. Phone: (09) 370 454.
Date of Introduction: 1988. August.
New Product–Documentation: Letter from Austin Holden. 1988. Dec. This August they began to produce a wider range of soy products, including tempeh. They use locally grown organically certified soybeans ("Biogro" certified by IFOAM).

1178. **Product Name:** Organic Tempeh [Mildly Spiced, or Tasty].
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1988. September.
Ingredients: Mildly Spiced: Organic soybean, water, cider vinegar, sea salt, spices, herbs, and culture *(Rhizopus oligosporus)*.
Wt/Vol., Packaging, Price: 300 gm in plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in March 1987. Seasoned: Blue, yellow and red on white. On the front panel: "Nutritious. Cholesterol free... For a high energy breakfast, quick lunch, or hearty main meal. No artificial flavouring, colouring, or preservatives. Improved quality. Fitness food."

1179. Bernard, Richard L.; Juvik, Gail A.; Hartwig, Edgar E.; Edwards, Calton J., Jr. 1988. Origins and pedigrees of public soybean varieties in the United States and Canada. *USDA Technical Bulletin* No. 1746. 68 p. Oct. [20 ref]
• ***Summary:*** Contents: Old domestic varieties. Modern domestic varieties from public institutions. Germplasm resources information network. Tables: 1. Number of U.S. and Canadian soybean varieties by maturity group. 2. Number of U.S. and Canadian soybean varieties by country of origin. 3. Origins and pedigrees of old domestic soybean varieties. 4. Lost old domestic soybean varieties. 5. Literature on old domestic soybean varieties in chronological order. 6. Origins and pedigrees of modern domestic soybean varieties from public institutions. 7.

Genetic information on backcross-derived public soybean varieties. 8. Genetic information on backcross-derived soybean parental lines. 9. Public soybean variety registrations and licenses. 10. Corrections to published pedigree information.

Abstract: "In this report are described the origins of the 440 U.S. and Canadian soybean varieties that are maintained in the USDA Germplasm Collection at Urbana, Illinois, and Stoneville, Mississippi. Varieties in commercial use before the mid-1940's were mostly introductions, and this report includes for each the geographic place of origin, the person or institution that provided the seeds, the foreign variety name (if any), as well as information about when it was released and who released it in the United States or Canada. Modern varieties have been developed by hybridization and selection. In this bulletin, the pedigree is specified and where and when each variety was developed and released. This information allows researchers and breeders to trace modern soybean varieties back to their introduced ancestors and facilitates breeding plans and evaluation of the germplasm base of the current commercial soybean crop."

Table 4, titled "Lost old domestic varieties," lists the source of each: Acme–PI 14.954 from Shanghai, China, in 1905. Akasoya–From Japan via Indiana. Allison Black–D.T. Allison, Tennessee. Amherst–PI 4.913 (PI 17.275) from Japan in 1900. Arikara–O. Will Company, North Dakota. Arkan–PI 87.050 from Niummen, Keisho Nando, Korea, in 1930. Arksoy 2913–Arkansas Experiment Station, Marianna (similar to 'Arksoy'). Auburn–PI 21.079A from Tieling, Manchuria, China, in 1907. Baird–PI 6.414 (PI 22.333) from Pyongyang [P'yongyang], Korea, in 1901. Biltan–Selection from 'Otootan', South Africa.

Brindle–PI 20.407 from Merkoechofka, Siberia, in 1906. Brooks–PI 16.789 from Hangchow, China, in 1905. Brownie–PI 6.414 (PI 17.256) from Pyongyang, Korea, in 1901. Buckshot–PI 6.334 (PI 17.251) from Tokyo, Japan, in 1901. Burnette–From Farmville, North Carolina. Butterball–PI 8.433 (PI 17.273) from Japan in 1902, via Rhode Island AES [Agricultural Experiment Station] in 1903. Chame–PI 80.473 from Tokyo, Japan, in 1929. Chang–PI 54.610-2 from Changchun, Kirin, China, in 1921. Chernie–PI 18.227 from Khabarovsk, Siberia, in 1906. Chinaton Echo–From Harrow, Ontario, Canada.

Chiquita–PI 27.707 from Hankow, China, in 1910. Chuku–La Choy Company, Ohio. Cibao–From El Salvador. Delnoshat–Delta Station selection 6679, Mississippi. Delredo–From Mississippi. DeSoto–Ohio farmer. Dortchsoy No. 2–Dortch Seed Company, Arkansas (selected from 'Ogden', similar to 'Ogden'). Dortchsoy No. 6–Dortch Seed Company, Arkansas. Dortchsoy No. 7–Dortch See Company, Arkansas. Doxie–Georgia Experiment Station.

Duggar–PI 17.268C, a selection from 'Ito San.' Early Brown–PI 25.130 and PI 25.161 from Tennessee AES and Indiana AES in 1909. Eda–PI 17.257 from Japan in 1890. Edgecombe–R.P. Cocke, Williamsburg, Virginia. Edna–PI 6.312 (PI 17.252C) from Tokyo, Japan, in 1901. Edward–PI 14.953 from Shanghai, China, in 1905. Fairchild–PI 19.184 from Newchwang, Manchuria, China, in 1906. Farnham–PI 22.312 from Shanghai, China, in 1908. Feed All–A.M. Johnson, North Carolina. Flat King–PI 6.312 (PI 17.252) from Tokyo, Japan, in 1901.

Flava–PI 16.789A from Hangchow, China, in 1905. Gala–Georgia Experiment Station. Gem–P.B. Hutchins, Missouri. George Washington–From Virginia. Giant Yellow–PI 22.415 from Naples, Italy, in 1908. Golden–Harrow Experiment Station, Ontario, Canada. Goshen Prolific–Farmer selection, North Carolina. Hamilton–From USDA number 23 by Ohio Experiment Station in 1909. Hankow–PI 6.559 from beyond Chiu Niu, China, in 1901. Hansen–PI 20.409 from Merkoechofka, Siberia, in 1906.

Hay Boy–Farmer selection, North Carolina. Herman–From North Carolina. Hiro–PI 86.038 from Obihiro, Hokkaido, Japan, in 1930. Hope–PI 6.335 (PI 17.267) from Tokyo, Japan, in 1901. Ignotum–E.E. Evans, Michigan. Italian–Canada Experiment Station. Ito San–PI 17.268 from Japan in 1890. Jet–PI 17.861 from Sachon, China, in 1906. Johnsoy–A.E. Johnson, North Carolina. Kentucky A–Kentucky Experiment Station selection.

Kia–Illinois Experiment Station selection. Kungchuling–From Manchuria, China. Looney No. 2–Farmer selection, Tennessee. Lowrie–PI 22.898A from Paotingfu, Chihli, China, in 1908. Loxitan–Delta Experiment Station selection, Mississippi. Ludeke–Farmer selection, North Carolina. LZ–Louisiana Experiment Station selection. Mammoth Brown–Unknown. Manhattan–PI 6.333 (PI 17.277) from Tokyo, Japan, in 1901. Matthews–Farmer selection, Georgia.

Merko–PI 20.412 from Merkoechofka, Siberia, in 1906. Meyer–PI 17.852 from Peking, China, in 1906. Midunk–Funk Brothers Seed Company, Illinois. Mikado–Farmer selection, Indiana. Misstucky–Farmer selection, Kentucky. Morgan–PI 22.633 from Sheklung, Kwongtung [Kwangtung / Guangdong], China, in 1908. Mount Carmel–PI 70.218-2 from Wuchiatzu, Manchuria, China, in 1926. Mukden No. 4–Wisconsin Experiment Station selection. Nanking–PI 71.597 from Nanking, China, in 1927 (see CNS, p. 6). Nanksoy–PI 104.881 from Nanking, China, in 1934.

Nansemond Early–Farmer selection, Virginia. Natsu–PI 19.984 from Yokohama, Japan, in 1907. Nemo–PI 19.985 from Yokohama, Japan, in 1907. Nielsen–PI 22.644B from Hangchow, Chekiang, China, in 1908. Nigra–PI 22.407 from Hong Kong, China, in 1908. Nuttall–PI 6.416 (PI 17.253) from Pyongyang, Korea, in 1901. Okute–PI 19.986 from Yokohama, Japan, in 1907. Oloxi–Coker's Seed Company, South Carolina. Otoxi–From South Africa. Ozark–PI 37.272 from Kogen Province, Korea, in 1914.

Pee Dee–Coker's Seed Company, South Carolina. Pingsu–PI 18.259 from Tschang-ping-tsu, China, in 1906. Preston–Virginia Experiment Station selection. Quillian–Farmer selection, Oklahoma. Rattlesnake–Kentucky Experiment Station selection. Riceland–PI 20.797 from Shanghai, China, in 1907. Rila–Marsh Foundation, Ohio. Sainte Anne–Canada Experiment Station selection. Samarow–PI 17.260 from J.M. Thorburn and Company in 1902. Saskatoon–Farmer selection, Canada.

Sedo–PI 23.229 from Tientsin, Chihli, China, in 1908. Sherwood–PI 17.862 from Tientsin, China, in 1906. Southern Green–PI 62.839 from Nanking, China, in 1925. Southern Prolific–PI 37.250 from Keiki Province, Korea, in 1914. Stuart–PI 22.644 from Hangchow, Chekiang, China, in 1908. Summerland–Canada Experiment Station selection [British Columbia]. Suru–PI 89.128 from Kyojo, Korea, in 1930. Swan–PI 22.379 from Canton, Kwangtung, China, in 1908. Taha–PI 21.999 from Boshan, Shantung, China, in 1907. Tanloxi–Delta Station selection 483, Mississippi.

Tashing–PI 20.854 from Harbin, Manchuria, China, in 1907. Tensas–PI 104.881 from Nanking, China, in 1934 (same as Nanksoy). Texoil–Farmer selection, Texas. Tinzan–From Australia. Trenton–PI 24.610, a selection from 'Mammoth (Yellow)' in Kentucky in 1904. Trinitaria–From El Salvador. U.S.-5–PI 54.563-5 from Jungchiangko, Shengking [Liaoning], China, in 1921. Vilnensis–From Poland. Vireo–PI 22.874 from Tokyo, Japan, in 1908. White Eyebrow–PI 30.745 from Wulukai, Kirin, China, in 1911.

Yellow Biloxi–North Carolina Experiment Station selection. Yokotenn–PI 19.981 from Yokohama, Japan, in 1907. Yosho–PI 6.314 (PI 17.262) from Tokyo, Japan, in 1901.

Talk with Dr. Richard Bernard. 1998. July 12. He considers this to be his best publication on this subject, but it is quite similar to *INTSOY Series* No. 30 titled "USDA soybean germplasm collection inventory. Vol. 1," published in August 1987. Address: 1-2. Urbana, Illinois; 3-4. Stoneville, Mississippi.

1180. Archer Daniels Midland Co. 1988. First quarter report to shareholders. Box 1470, Decatur, IL 62525. 16 p.
• ***Summary:*** President Randall's Report–stated that the greatest concern of Americans in the 1990s will be the environment. 1. ADM now has in operation eleven large fluid bed boilers for cogeneration of power and process steam. 2. Worldwide technology has been licensed for using a special grade of starch to render disposable plastics degradable. 3. Ethanol is a third contribution to clean environment. Ethanol fuels have a high oxygen content, a major factor in reducing carbon monoxide poisoning of the atmosphere.

"There is a tremendous demand all over the world for soy protein products to replace subsidized milk powder. Our soy protein concentrate plant is completed and is now operational. We will double its size in early 1989 and are making plans to double it again before 1990, in response to the new demand.

"We are also doubling the size of our edible soy protein isolate plant, with plans for further increases in 1989 and beyond. We are constructing a plant for industrial isolates for the paper industry, to be sold in conjunction with our corn starches.

ADM now produces soybean flour, grits, TVP, concentrate and isolate, the most complete line of edible soy products of any producer.

Chairman Andreas' Report–The U.S. Government has more control over what the farmers plan and the prices they receive today than they have ever had in history.

Government imposed embargoes cause massive restructuring of world trade and processing. Examples: Immediately after the 1980 embargo, the following fundamental permanent adjustments in world trade occurred: 1. The EEC, in emergency meetings, alarmed that the U.S. would cut off exports for political reasons, resolved to become self-sufficient, particularly in oilseeds, with the result that they increased production of wheat and have become a large surplus producer of wheat. 2. Japan, equally alarmed, immediately made $1,000 million available to Brazil to expand soybean production 300%. 3. The Soviet Union took its order book to Brazil, Canada, Argentina, Australia, and the EEC, cutting the U.S. from a 75% supplier to a 25% supplier. 4. Canada and Australia responded with 20% increases in production. Address: Decatur, Illinois.

1181. **Product Name:** Soyfoods Tofu.
Manufacturer's Name: Great Australian Tofu Pty. Ltd.
Manufacturer's Address: Factories 12-1, 2 Paton Place, Manly Vale, NSW 2093, Australia. Phone: (613) 580-8688.
Date of Introduction: 1988. November.
New Product–Documentation: Form filled out by Lindsay Kotzman, owner. 1989. Jan. He purchased the business in Nov. 1988. Monthly production of this tofu is 5,000.

Note: This company was originally founded in Dec. 1978 as The Soy Bean Factory in Sydney by Michael De Campo, Yoshiko Wright, and Marcea Weber.

1182. **Product Name:** Simply Better Tofu, Tofu Burgers, Marinated Tofu Pouches, Tofu Paté, Tofu Cottage Cheese, Tofu Dressing [Curry, or Garlic & Dill], Tofu Mayonnaise.
Manufacturer's Name: Progressive Foods Pty. Ltd.
Manufacturer's Address: 24-B Braeside Dr., Braeside, VIC 3195, Australia. Phone: 613-580-8688.
Date of Introduction: 1988. November.
New Product–Documentation: Form filled out by Lindsay Kotzman, owner. 1989. Jan. She purchased the business in Nov. 1988. Monthly production is as follows: Tofu (375 gm and 750 gm): 7,000 kg. Tofu burgers: 1,000 kg. Marinated

tofu pouches: 1,000 kg. Tofu cottage cheese: 100 kg. Tofu paté: 80 kg. Tofu dressings: 30 kg each flavor. Tofu mayonnaise: 30 kg.

1183. **Product Name:** Simply Better Soy Sausages.
Manufacturer's Name: Progressive Foods Pty. Ltd.
Manufacturer's Address: 24-B Braeside Dr., Braeside, VIC 3195, Australia. Phone: 613-580-8688.
Date of Introduction: 1988. November.
New Product–Documentation: Form filled out by Lindsay Kotzman, owner. 1989. Jan. She purchased the business in Nov. 1988. Monthly production of soy sausages for grilling and boiling (broiling?) is 300 kg.

1184. **Product Name:** Simply Better Soy Yoghurt [Natural, or Flavoured].
Manufacturer's Name: Progressive Foods Pty. Ltd.
Manufacturer's Address: 24-B Braeside Dr., Braeside, VIC 3195, Australia. Phone: 613-580-8688.
Date of Introduction: 1988. November.
New Product–Documentation: Form filled out by Lindsay Kotzman, owner. 1989. Jan. She purchased the business in Nov. 1988. Monthly production of soy yoghurt is 50 kg of each flavor.

1185. *Technique Laitiere & Marketing.* 1988. Les laitiers s'intéressent au soja [The dairies take an interest in soyfoods]. No. 1034. Nov. p. 65. [Fre]
• ***Summary:*** Discusses and pictures several products: Sojasun, a dessert made by Triballat, in part from soya, closely resembles a fermented dairy product, but does not quite resemble a yogurt. It contains bits of fruits and has a very fruity flavor. Soja Biostar is a line of soy products made by the Celia group. Sunsoya has been launched by Prolait. So Good is an Australian soymilk product which won the 1988 SIAL gold medal (SIAL d'Or 88). SIAL is the International Food and Dairy Exhibition in Paris. Cacoja was introduced by the cooperative of Colmar.

1186. *Palawija News (Bogor, Indonesia).* 1988. Role of CGPRT crops in developing countries. 5(4):4. Dec. [2 ref]
• ***Summary:*** RAPA stands for "Regional Office for Asia and the Pacific."

In the past two decades the socio-economic context of CGPRT crops has changed from semi-subsistence toward more commercially-oriented production. Some crops, notably maize, soybeans and cassava, have become important trade commodities.

The per capita availability of arable land in the region fell from 0.287 ha in 1972 to 0.270 ha in 1982. This is the lowest land-man ratio to be found among the major regions of the world. Since the start of the green revolution, while the area of irrigated land per capita rose 6.5% from 0.077 ha in 1972 to 0.082 ha in 1983, that of non-irrigated land per capita fell 10.5% from 0.210 ha in 1972 to 0.188 in 1982 (FAO RAPA 1985). These facts, combined with the stagnant or even diminishing yields of CGPRT crops, explain the growing income disparity between farmers on irrigated and non-irrigated land.

Ranking the top 8 individual CGPRT crops by subregion in 1984: In South Asia, pulses are 1st and soybeans are 7th. In Southeast Asia, maize is 1st and soybeans are 6th. In East Asia other coarse grains (millet, sorghum, etc.) are 1st and soybeans are 3rd. In the South Pacific, taro is 1st and soybeans are not listed.

CGPRT crops are grown mostly on the uplands and in remote areas, to which only limited government attention is usually paid.

The green revolution in the early seventies has made the production of rice, wheat and maize more profitable than of other food crops. Yields and harvested areas of these crops expanded most during the period from 1974 to 1984. Most CGPRT crops showed only marginal increases in yields while the harvested areas of some even decreased. The green revolution appears to have pushed secondary crops into marginal upland areas.

1187. *SanCo News (Sanitarium Health Foods Co., Australia).* 1988. Now the world thinks we're as good as gold: The Gold Food Oscar for So Good. Dec.
• ***Summary:*** "So Good was honoured at the 1988 AIDA-SIAL International Food Oscars held recently in Paris. As one of only 5 products representing Australia, So Good won a Gold Oscar by winning its category for the world.

"A total of 16 countries participated in the competition. An international panel of judges evaluated hundreds of products based on their uniqueness, appeal and sales performance. So Good won the 'non-alcoholic beverages' category thereby establishing itself as the best new product, in its category, in the world for 1988."

"The international award has created many enquiries about So Good from interested parties around the world." Address: Wahroonga, Australia.

1188. Beckham, Nancy. 1988. Herbal help to avoid menopause symptoms. *Australian Wellbeing* No. 29. p. 74-76. [5 ref]
• ***Summary:*** In the section titled "Oestrogens in foods and herbs and how to use them" there are subsections on alfalfa, red clover, sage, parsley, aniseed, fennel, hops, soya beans, and fenugreek. She suggests that if women eat these foods, they will experience relief of menopausal symptoms. The section on soya beans states that sprouts are the best way to use soya beans for relief of menopause symptoms because sprouting dramatically increases the oestrogen content. However soya beans are quite difficult to sprout because they become moldy and smelly if not washed and drained well and often. "They are amazingly tasty but wait until you

have learned to sprout alfalfa and mung beans before trying them."

Dried soya beans can also be used, but they need to be soaked and cooked for a long time. If you don't normally eat dried beans, start with small quantities, "otherwise you will probably have severe abdominal colic and flatulence."

Note: This is the earliest document seen (Dec. 2000) that discusses consumption of soyfoods as a way of reducing menopausal symptoms. Address: Author, Australia.

1189. Berry, S.; Nguyen, S.H. 1988. High rate ultrafiltration of soyextract. *Desalination* 70:169-76. *

1190. Larcher, Jacques; Volper, S.; Aubin, J.P. 1988. Le soja en régions tropicales: une synthèse des recherches de l'IRAT [The soybean in tropical regions: A summary of research conducted by IRAT]. *Memoires & Travaux de l'IRAT (France)* No. 15. 185 p. [91 ref. Fre]

• ***Summary:*** IRAT stands for *Institut de Recherches Agronomiques Tropicales* (Tropical Institute of Agronomic Research). Contents: Varietal improvement: Introduction of varieties, screening varieties, creating new varieties. Cultural practices: Preparing the soil, water needs of the soybean, planting, harvest, production and storage of seeds. Cultural systems: Crop rotations, companion crops, times of working. Fertilizers: Mobilization minerals, diagnosis based on foliage, nitrogen fertilizers, phosphate fertilizers, potassium fertilizers, organic manure, preformulated manure. Inoculation: Effects of inoculation on the nodulation and the yield of soybeans, methods of inoculation, selection of stocks of *Rhizobium japonicum*, determination of the dose of inoculum suited to the field, production of inoculum, survival of *Rhizobium japonicum* in tropical soils. Crop protection: Bacterial diseases, fungal diseases, viral diseases, nematodes, insects, chemical defoliation, herbicides. Technology: Senegal, Cameroon.

Appendixes: 1. List of varieties. 2. List of the main soybean varieties introduced to Benin, Burkina Faso, Cameroon, Comoro Islands, Côte d'Ivoire, Ethiopia, French Guiana, Madagascar, Mali, Niger, Polynesia, Central African Republic, Reunion and Martinique, Senegal, Togo. 3. Norms of observation and methods employed by IRAT. 4. Improvement of the components of soybean yield. Technical guide for growing soybeans in Senegal, Côte d'Ivoire, and French Guyana.

The section titled "Introduction of Varieties" (p. 9) notes that between the first and second world wars, the French peasantry introduced the soybean to Madagascar and cultivated it in the regions of Ambatolampy, Antsirabé, and Ankazomiriotra. It is interesting to note that it was in the latter locality that the first attempts were made to transform soybeans into milk and cheese [soymilk and tofu] in Madagascar. In Cameroon, eleven varieties, which originated in the USA and East Asia, were introduced between 1924 and 1945.

In 1965 IRAT introduced the soybean into its research programs and began, as a first step, by establishing soybean varietal collections in the different countries where IRAT was working: 1966 in Senegal, Madagascar, and Cameroon. 1967 in the Central African Republic and Mali. 1968 in the Côte d'Ivoire. 1969 in Benin. 1971 in the Comoro Islands. 1972 in Ethiopia. 1974 in Togo and Niger. 1975 in Burkina Faso, Réunion, French Guiana, Martinique, and Polynesia. The first collections, established in 1966 from soybean varieties originating in Rwanda, the USA, Rhodesia, and Tanzania, were progressively disseminated to the other countries.

Subsequent participation of IRAT researchers in the international variety trials conducted by INTSOY (USA) and by IITA (Ibadan, Nigeria) enabled IRAT to diversify its genetic resources and to test, mainly through the INTSOY trials, the varieties that it had developed.

Varietal selection (p. 10-22): Senegal: From 1966 to 1970, 120 soybean varieties received were tested by CNRA of Bambey (Baol), then at Nioro du Rip (Sine-Saloum), where the best yields, of about 1,500 to 2,000 kg/ha were obtained with the variety Geduld. Starting in 1970 Bambey was abandoned and trials were continued at Séfa (Sefa, Casamance) and Synthiou Malème (in eastern Senegal), where the ecology was more favorable for soybean cultivation. Breeding of new varieties started in about 1972 in Senegal (see p. 22-33)

Central African Republic: In 1967, at the request of the Ministry of Rural Development, via FAO, 80 soybean varieties of very diverse origins were introduced and tested at the Grimari station. The variety Avoyelles yielded 1,218 kg/ha.

Mali: The varieties G15 and G115 (Jupiter) from Burkina were introduced to Mali in 1967. Then in 1969 IRAT introduced 26 new varieties, of which 11 originated in the Central African Republic and 15 in Senegal.

Côte d'Ivoire: From 1968 to 1977 IRAT introduced 171 soybean varieties to the Côte d'Ivoire.

Togo and Benin: These two contiguous countries have comparable ecologies. IRAT's with soybeans in Benin began in 1969. In 1970 IRAT introduced to Niaouli, Benin, 45 varieties originating in Taiwan, Central African Republic, Madagascar, and Senegal. This collection was continued from 1970 to 1974, because two crops a year were possible, at the stations of Niaouli and Ina in Benin, and 3 stations in Togo. In 1975 IRAT-Togo cooperated with INTSOY in the first soybean trials in Togo. The first seeds were planted at Davié in southern Togo on May 2, at Amoutchou in central Togo on May 7, and in Kitangbao in northern Togo on July 8. Togo. Table 12 shows the average yields from 1970 to 1974 from the varieties Columbia, Mandarin, Clark 63, and E 73. These yields were low due to the absence of any use of fertilizers or inoculants, and the poor germination of the seeds. [Note: From Whigham and Judy (1975) and Dumont (1981) we have learned the exact dates that soybeans were planted in Benin and Togo]. Comoro Islands: 63 soybean varieties from the Madagascar collection were introduced in 1971 and tested on Grand Comoro *(Comore)* and at Anjouan (800 meters altitude). At Anjouan the best variety was Biloxi, which had an average yield of 2,000 kg/ha. On Grand Comoro the yields were lower, about 1,500 kg/ha. Having little future, soybean research was stopped in 1976. Note: This document contains the earliest date seen for soybeans in the Comoro Islands, or the cultivation of soybeans in the Comoro Islands (1971) (one of two documents). The source of these soybeans was Madagascar.

Niger: In 1974 IRAT introduced from Senegal 17 varieties of various origins; the results were mediocre (in part from absence of inoculation): ICA Toroa 662 kg/ha, ICA Lili 312 kg/ha, Improved Pelican 335 kg/ha, Mandarin 300 kg/ha. Two INTSOY trials took place in 1975 at Maradi and Gaya. This time the yields were very encouraging: at Maradi the variety Forrest yielded 3,500 kg/ha.

Note: This document contains the earliest date seen for soybeans in Niger, or the cultivation of soybeans in Niger (1974). The first 17 varieties introduced originated in various countries.

Burkina Faso: The soybean was introduced to this remote country in 1960. At that time IRHO *(Institut de Recherches pour les Huiles et Oléagineux)* was in charge of experiments on this plant. In 1975 IRAT participated in an INTSOY trial at Farako-Ba; Jupiter gave the best yield, 2,405 kg/ha.

Réunion: Four varieties from the USA were tested in 1974, at the station of Mon Caprice, during two seasons. The best yield during the cool season was from Chippewa (1,780 kg/ha), and during the warm season it was from Amsoy (2,070 kg/ha).

Martinique: IRAT-Martinique participated in the 1975 INTSOY trials. Only one variety, Improved Pelican, with a yield of 2,150 kg/ha [sic, 2,154 kg/ha, planted 10 April 1975] seemed interesting, but since soybean cultivation was believed to have no future in the agriculture of the island, the experimentation was abandoned.

French Guiana: The first soybean trials began in 1975 with the introduction of 4 varieties: Jupiter, Acadian, and Improved Pelican from the USA, and Vada, which originated in Java [Indonesia]. From 1976 to 1983 IRAT-Guyane participated in INTSOY trials. In 1976 Jupiter gave the top yield of 3,440 kg/ha.

French Polynesia: From 1976 to 1979 the INTSOY trials continued during the two rainy seasons. The variety Davis gave the best overall average yields (4,260 kg/ha over 5 seasons), with a top yield of 5,286 kg/ha in 1976-77. Address: France.

1191. Lea and Perrins. H.P. Foods Ltd. A wholly owned subsidiary of B.S.N. Limited. 1988. The history of Lea & Perrins (Leaflet). Worcester, England. 2 p. 30 x 21 cm. Black on green.

• ***Summary:*** Lea & Perrins "Original and Genuine" Worcestershire Sauce has been at the factory on Midland Road in Worcestershire since the factory was built in 1897. Still today the unmistakable aromas rise from oak casks stored below the ground. The recipe is understood to have been brought to England in 1835 by Marcus, Lord Sandys, who had held many offices in the east [i.e. in Asia] including that of the Governor of Bengal.

"On his return from India to his native Worcestershire, Lord Sandys took the recipe to John Lea and William Perrins, chemists who owned a pharmacy in Broad Street, Worcester. At Lord Sandys' request, the chemists made up the sauce and, probably to satisfy their own curiosity and to assess the sauce's viability as a commercial proposition, prepared a quantity for themselves which they put into stone jars. When they tasted the sauce, however, they found it so unpalatable that they consigned the jars to the cellar. Some time later they re-discovered the jars and, before throwing them out, tasted the sauce again. It tasted superb! The sauce had matured.

"The reputation of the sauce originally made for Lord Sandys quickly spread and Messrs Lea & Perrins decided to obtain the recipe permanently from Lord Sandys to manufacture and sell under the now familiar Lea & Perrins name.

"To this day the recipe remains a closely-guarded secret and only a handful of people know the exact ingredients, proportions and maturing processes involved in the manufacture of Lea & Perrins Worcestershire Sauce. With Lord Sandys' permission, the sauce was first sold commercially in 1837 and in 1849 arrangements were made for its export to New York.

"By 1849 Lea & Perrins Worcestershire Sauce had rounded Cape Horn. The crew of a ship sailing up the Pacific coast to the United States deserted to join the 1849 Gold Rush, leaving only the captain and the 'supercargo', the man directly responsible for the cargo, to sell off the goods they were carrying. Itemised on the cargo list was the famous sauce, along with a selection of medicines and Lea & Perrins trusses!

"An undamaged bottle was unearthed by archaeologists investigating the town of Te Wairoa in New Zealand. The town had been destroyed by a volcano in 1886–so the sauce must have reached New Zealand before that date!...

"Lea & Perrins Limited was acquired by HP Sauce Limited in 1930. In 1967 Imperial Tobacco (now Imperial Group) acquired HP Sauce and the Lea & Perrins brands with it... The product is used in over 130 countries."

Photos show: (1) Seven old Lea & Perrins bottles, two of them with labels. The earliest, which has no label, dates from 1866. (2) Three present sizes of bottles, 20, 10, and 5 fl. oz. The first 3 ingredients are vinegar, molasses, and vinegar–in that order. Address: Midland Road, Worcester, WR5 1DT, England.

1192. McClure, Bruce A.; Guilfoyle, Tom. 1989. Rapid redistribution of auxin-regulated RNAs during gravitropism. *Science* 243(4887):91-93. Jan. 6. [15 ref]
• ***Summary:*** Gravitropism is the bending of plants in response to gravity. It is caused by differential growth rates on opposite sides of the plant. The aerial portions grow up and the roots grow down. Auxin, a plant hormones, is believed by some to play a major role in gravitropism by controlling the rate of cell extension. When soybean seedlings were vertically oriented, auxin-regulated RNAs were symmetrically distributed in the elongation region of the hypocotyl (the part of the seedling below the cotyledons, i.e. the sprout). In horizontally oriented seedlings, the distribution became asymmetrical within 20 minutes and the greatest asymmetry coincided with the onset of rapid bending. "The results provide a clear correlation between the dynamic expression of genes under auxin control and a morphogenetic phenomenon traditionally known as an auxin response." Address: Dep. of Biochemistry, Univ. of Missouri-Columbia, Columbia, Missouri 65211. McClure's present address: Plant Cell Biology Research Center, Univ. of Melbourne, School of Botany, Parkville, Victoria 3052, Australia.

1193. Kenworthy, W.J. 1989. Potential genetic contributions of wild relatives to soybean improvement. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 883-88. [31 ref]
• ***Summary:*** "Increased emphasis on germplasm diversity during the past decade has raised awareness of the wild *Glycine* species as potential germplasm donors to cultivated soybean [*Glycine max* (L.) Merr.]. Utilization of the wild relatives has received little emphasis, however, in soybean cultivar development programs. The wild species generally have several agronomically undesirable traits such as a twining growth habit, shattering seed pods, and hard colored seed coats...

"The International Board for Plant Genetic Resources recognizes the more than 1400 accessions held in Canberra, Australia, as the world base collection for perennial *Glycine*. Glycine species in the subgenus Glycine are *Glycine arenaria Tind., G. argyrea Tind., G. Canescens F.J. Herm., G. Clandestina Wendl., G. curvata Tind., G. cyrtoloba Tind., G. falcata Benth., G. latifolia (Benth) Newell & Hymowitz, G. latrobeana (Meissn.) Benth., G. microphylla (Benth.) Tind., G. Tabacina (Labill.) Benth., G. tomentella Hayata.*" The first 10 of these species have 40 chromosomes. G. tabacina has 40 or 80. G. tomentella has 38, 40, 78, or 80.

Disease resistance is one of the most common reasons for attempting to use wild species. Perennial species have an unexpected resistance to herbicides which are toxic to soybeans. Thus "the wild perennial Glycine species offer a new and important genetic resource to soybean improvement." Address: Univ. of Maryland, Dep. of Agronomy, College Park, MD 20742.

1194. Mulyowidarso, Robert K.; Fleet, G.H.; Buckle, K.A. 1989. The microbial ecology of soybean soaking for tempe production. *International J. of Food Microbiology* 8(1):35-46. Feb. [27 ref]
• ***Summary:*** "Soybeans soaked in tap water for 26 to 36 hours at 20, 30 or 37ºC underwent a natural fermentation that was characterized by the growth of microorganisms to 100 million to 10,000 million colony forming units (cfu) per ml (depending on the temperature) and a reduction of pH from 6.5 to 4.5. *Lactobacillus casei, Streptococcus faecium, Staphylococcus epidermidis* and *Streptococcus dysgalactiae* dominated the fermentation but, significant contributions were also made by *Klebsiella pneumoniae, Klebsiella ozaenae, Enterobacter cloacae, Enterobacter agglomerans, Citrobacter diversus* and *Bacillus brevis*, and the yeasts *Pichia burtonii, Candida diddensiae* and *Rhodotorula rubra*. Fermentation of surface-decontaminated beans in sterile water with pure cultures of these isolates showed *L. casei, Strep. faecium* and *Staph. epidermidis* to be the main species responsible for the pH reduction. Soybeans were the main source of microorganisms for the fermentation. Boiled beans did not undergo an acid fermentation." Address: Dep. of Food Science and Technology, The Univ. of New South Wales, Kensington, NSW, Australia.

1195. Shanmugasundaram, S. 1989. Global cooperation for the improvement of soybean research and development. In: A.J. Pascale, ed. 1989. World Soybean Research Conference IV. Buenos Aires: Continuing Committee. xxviii + 2152 p. See p. 1939-47. [17 ref]
• ***Summary:*** "Soybeans became a global crop after its introduction and adoption as an industrial crop in the U.S.A. The collaboration between China and the U.S.A. on soybean germplasm collection marked the beginning of global cooperation for soybean research and development. A number of international agricultural research centers such as AVRDC, UN/ESCAP CGPRT Centre, IBPGR, IITA, INTSOY, and IRRI presently conduct worldwide research and development activities on soybean... Their problem-oriented research activities with an interdisciplinary approach should be continued to help improve soybean production, processing, marketing and utilization particularly in the densely populated, developing countries

in Asia and Africa. At least 400 to 600 million children in the world's 60 poorest countries suffer from chronic malnutrition and more than one fourth of the world's population suffer from hunger during some part of each year. Soybeans with 40% protein and 20% oil could help alleviate protein and calorie malnutrition. FAO/UNDP, USAID, ACIAR, IDRC, Winrock International and World Bank, among others, are the major funding agencies which encourage and support the research and development activities of soybean. The global cooperation includes regional networking, germplasm exchange, specific research activities, manpower training, workshops, conferences and information exchange. A consolidation of such support for integrating various forces is being proposed to further promote the research and development effort on soybeans...

"INTSOY initiated the International Soybean Variety Experiment (ISVEX trials). From 1973 to 1985, more than 2,000 ISVEX trials were distributed to 132 countries around the world. INTSOY also received a number of breeding lines from cooperators in 34 countries and included them in a preliminary screening program called "The Soybean International Experimental Variety Evaluation (SIEVE) and Soybean Preliminary Observation Trial (SPOT). India, Sri Lanka, Peru, Egypt, Turkey, Ecuador, Costa Rica, Nepal and Guatemala are among the more than 20 countries now commercially growing soybean varieties introduced through INTSOY trials...

"Institutions and agencies involved in soybean: Category I. Production and utilization research: Asian Vegetable Research and Development Center (AVRDC), International Board for Plant Genetic Resources (IBPGR), International Food Policy Research Institute (IFPRI), International Institute of Tropical Agriculture (IITA), International Soybean Program (INTSOY), International Rice Research Institute (IRRI), United Nations Economic Social Commission for Asia and the Pacific's Coarse Grains, Pulses, Root and Tuber Crops Centre (UN ESCAP/CGPRT Centre), European Cooperative Research Network on Soybean (ECNS).

"Category II. Marketing research: American Soybean Associations in various countries, ESCAP CGPRT Centre, Food and Agriculture Organization of the United Nations (FAO), IFPRI, Soyfoods Center.

"Category III. Funding agencies: United Nations Development Programme (UNDP), Food and Agriculture Organization of the United Nations (FAO), United States Agency for International Development (USAID), Australian Centre for International Agricultural Research (ACIAR), International Development Research Centre (IDRC), Canadian International Development Agency (CIDA), Winrock International, World Bank, Asian Development Bank, Japan International Cooperation Agency (JICA), Institut de Recherches Agronomiques Tropicales et des Cultures Vivrieres (IRAT), Agency for Technical Cooperation (GTZ).

"The AVRDC commenced its soybean research with the goal of developing stable, high yielding soybeans for the tropics and subtropics. Since 1973, AVRDC has accumulated more than 11,000 accessions of soybean. The Center has provided more than 31,000 breeding lines and varieties to 164 scientists in 56 countries. AVRDC Soybean Evaluation Trial Network (ASET) was initiated in 1980." Address: Asian Vegetable R&D Center, P.O. Box 205, Taipei 10099 Taiwan.

1196. Tenpe Kenkyushu-kai. 1989. Dai ikkai Tenpe Kenkyû shûkai: Kôen yôshi [Tempeh Research Society: First meeting lecture outline]. Kobe Park City 2-1110, 6-2-1 Minatojima, Chuo-ku, Kobe 650, Japan. 5 p. [Jap]

• ***Summary:*** The first meeting took place on 25 Feb. 1989 at the offices of the Yuki-jirushi (Snow Brand) Milk Co. in Shinjuku, Tokyo. Three talks on tempeh were presented: Yasuko Torii, a natural foods expert, presented "Report on the Natural Foods Expo: Soyfoods in America and Australia," focusing on the Anaheim Expo (April 1988) with its Soyfoods Pavilion and tempeh. Noriyuki Okada of the National Food Research Inst. (Tsukuba) discussed "Searching for the origin of useful genes." And Toshiie Maeda of Hyogo prefecture talked about "Revitalizing a village with a tempeh industry."

The second meeting took place on 24 June 1989 in Osaka. Masahiko Terajima of Fuji Oil Co. Research Dept. spoke on "The present status of soy protein and soy protein foods in Japan." Eihachiro Kato of Meiji Univ. discussed "Low-pressure frying of tempeh." And Nobu Kawabata of Kyoto City Univ. spoke on the "Okara tempeh and its usage." Address: Kobe, Japan. Phone: 078-302-7065.

1197. Calvert, Ken. 1989. Utilisation of low grade wheat. Report on laboratory production of tempeh in Southland. Renertech, R.D. 2, Winton 9662, New Zealand. 3 p. March 20. Unpublished manuscript.

• ***Summary:*** Dr. Richard Beyer at Otago Univ. in Dunedin suggested that waste of low grade wheat and breadcrumbs might be minimized if they were made into tempeh. An Indonesian student of his had made tempeh from these substrates. Soy Foods of Christchurch makes commercial soy tempeh. Calvert has spent the last 3 months 4-8 hours/week using a variety of locally grown materials to make tempeh. Address: Winton, New Zealand.

1198. **Product Name:** Nice 'n' Healthy: Soy Food Drink.
Manufacturer's Name: Down to Earth Natural Products Ltd.
Manufacturer's Address: Box 12082, Penrose, Auckland, New Zealand. Phone: (09) 590 592.
Date of Introduction: 1989. March.

Ingredients: Soya protein [isolate], vegetable oil, maltose syrup, maltodextrin, fructose, vegetable emulsifier and stabiliser (471, 401, 412), mineral salts [incl. calcium] (341c, 170, 332, 340, zinc gluconate), vitamins (B-1, B-2, B-12, A, D), water added (pure south island artesian water).
Wt/Vol., Packaging, Price: 1 liter Tetra Brik Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 100 ml.: Energy 260 kj, protein 3.4 gm, fat 3.4 gm, carbohydrate 4.7 gm, calcium 116 mg, phosphorus 58 mg, sodium 44 mg, potassium 140 mg, zinc 0.34 mg, vitamin B-1 0.04 mg, vitamin B-2 0.17 mg, vitamin B-12 0.50 mcg, vitamin A 40 mcg, vitamin D 0.33 mcg.
New Product–Documentation: Label (carton with product) sent by Bean Supreme (Box 12082, Penrose, NZ). 1990. Feb. 19. 3.75 by 6.5 by 2.5 inches. Tetra Brik carton. Blue, tan, green, and yellow on white. Down to Earth logo is a green sphere. "The milk alternative." An illustration on the front panel shows a table setting with a pitcher and glass of milk, stack of pancakes, a daisy, strawberries, and fried tofu. Back panel reads: "Nice 'n' Healthy contains 8.5 gm of quality protein for every 250 ml serving. Calcium rich. Nice 'n' Healthy contains as much calcium as milk [290 mg per 250 ml serving], and other vitamins and minerals important to people who may be restricting their intake of meat or dairy products." Top of carton reads: "Best before 11 Jul 1990. Serve chilled. Refrigerate once open. Shake well. Calcium rich. No lactose. No cholesterol. Distributed in Australia by Spiral Foods, 13 Cubitt St., Richmond, Victoria. Phone: 03-429-8425.

In about Feb. 1990 the company changed its name from "Bean Supreme" to "Down to Earth Natural Products Ltd." Bean Supreme will remain as a brand name for their existing and expanding range of traditional soy products. This is the first product launched under the new name.

Letter from Trevor Johnston, Managing Director of Bean Supreme Ltd. 1994. July 8. This isolate-based soymilk was launched in March 1989. It is sold in an aseptic carton, a color photo of which is shown.

1199. Anderson, Ronald L. 1989. Re: Update on history of Continental Grain Company's involvement with soybeans. Letter to William Shurtleff at Soyfoods Center, April 13. 3 p. Typed, with signature.
• ***Summary:*** Update on chronology: 1986 Sold Liverpool, England, soybean crushing plant, 2,000 TPD (tonnes per day). 1987 Sold crushing plant in Cameron, South Carolina, 1,000 TPD. So now Continental has only one U.S. soybean crushing plant at Guntersville, Alabama (2,000 TPD capacity). 1987. Closed Oleaginosa in Argentina (a tung nut plant). 1988 Sold plant in Culbertson, Montana, crushing safflower and sunflower seeds (acquired in 1975), 400 TPD. 1989. Formed joint venture marketing company with Quincy Soya, in Quincy, Illinois. 1989. Plan to sell all South American and Australian plants, and to upgrade Italian plants.

In 1985 Continental's worldwide daily oilseed crushing capacity (mostly but not only soybeans) was 11,800 TPD. By April 1989 it had decreased to 9,700 TPD, an 18% drop in 5 years.

"The U.S. crushing industry continues to consolidate, with 85% of the industry in five hands. I think the industry will eventually consolidate to four major participants controlling 85-90% of the industry.

"Continental's strategy is centered on international trade and forming alliance's with smaller crushers who are not exporters but who need Continental's international export outlets. We are also forming similar alliances with South American Processors.

"Continental has concluded that the capital costs required are too large to become a major processor at this late stage in a mature industry. Thus, we are concentrating on trading and forming alliances with processors for mutual benefit."

Note: ITT Continental Baking Co. and CFS Continental (which merged with A.E. Staley Mfg. Co.) several years ago have never been related to Continental Grain Co. However A.E. Staley and Continental Grain Co. did have a joint venture from about 1984 until 1988 or 1989. It was for marketing soybean meal and corn gluten feed pellets. Address: Senior Vice President and General Manager, Continental Grain Co., World Processing Div., 277 Park Ave., New York, NY 10172. Phone: 212-207-5100.

1200. *Crop Science.* 1989. Theodore Hymowitz: Frank N. Meyer Memorial Award. 29(2):522-23. March/April.
• ***Summary:*** "Theodore Hymowitz was born 16 Feb. 1934 in New York City. His parents Ethel and Bernard emigrated to the USA in their youth from Poland. Theodore graduated from the Crown Heights Yeshivah and Boys High School, Brooklyn, New York, in 1948 and 1951, respectively. As a young boy he often visited nearby Prospect Park, the botanical gardens, zoo and museum and developed a lifelong interest in plants and animals.

"He received the B.S. degree in agriculture from Cornell Univ. in 1955 and M.S. degree in agricultural chemistry and soils from the Univ. of Arizona in 1957. Thereafter he was drafted into the U.S. Army for 2 years. Following basic training at Fort Benning, Georgia, he was stationed at the Quartermaster Research and Engineering Center, Natick, Massachusetts, where he worked as a chemist in a microbiology laboratory.

"Upon discharge from the Army in 1959, he enrolled at Oklahoma State Univ. where he received his Ph.D. in genetics and plant breeding in 1963. At Oklahoma State he was greatly influenced by the potential of plant introductions by his advisor, Dr. Ralph S. Matlock, and by Dr. Jack R. Harlan, a Frank N. Meyer Medalist. As a graduate student he was a Loeb Foundation Scholar and a Fulbright Scholar in India. At the Indian Agricultural Research Institute, New Delhi, in the laboratory of Dr. M.S. Swaminathan, he conducted cytological research on the genus *Cyamopsis* [which includes guar] and under the tutelage of Prof. H.B. Singh, the father of plant introductions in India, he collected guar germplasm. The entire guar collection was sent to the USA and placed in the PI [Plant Introduction] system. The guar research conducted at Oklahoma State Univ. and in India was incorporated into a book coauthored with Dr. R.L. Whistler, published by Purdue Univ. Press in 1979.

"The development of the transdomestication concept was the main feature of Dr. Hymowitz's research on guar. The transdomestication concept is defined as the movement by humans of a wild species from its indigenous area to another region where it subsequently is domesticated. Guar and the tomato are examples of possible transdomesticates.

"From 1964 through 1966, Dr. Hymowitz was employed as an agronomist by the IRI Research Institute, Campinas, Brazil. In Brazil he spent 2 years collecting, identifying and maintaining legumes having potential forage value and sent a collection of about 750 accessions to the USA to be placed in the PI system. Dr. Hymowitz was also a technical advisor to the Brazilian National Soybean Commission.

"Upon joining the faculty at the Univ. of Illinois in early 1967, he was immediately sent to India for 6 months to initiate soybean production experiments at the Uttar Pradesh Agricultural Univ., Pantnagar and J. Nehru Agricultural Univ., Jabalpur. His final report and published research papers become the model for the establishment of the International Soybean Program (INTSOY) at the Univ. of Illinois. In addition he collected soybean in the Kumaon Hills of Uttar Pradesh, a physically demanding expedition since the soybean were collected from fields on mountain terraces from 1100 to 2500 meters above sea level. The soybean collected were incorporated into the PI system.

"Upon his return to the Univ. of Illinois, Dr. Hymowitz initiated a project to investigate the variation in and genetics of antinutritional and biologically active components of soybean seed. Under his direction, his graduate students and colleagues were able to elucidate the mode of inheritance of soybean seed lacking or having very low amounts of the Kunitz trypsin inhibitor, lectin, β-amylase, lipoxygenase-1 and urease...

"In 1974, Dr. Hymowitz and colleagues were the first to report the use of a near-infrared light reflectance instrument to estimate simultaneously the oil and protein concentration in corn, soybean, and oat seed...

"From 1972 through 1976, Dr. Hymowitz visited major herbaria in Asia, Africa and Europe in order to examine their *Glycine* specimens. During these years he also worked in the Univ. of Illinois library, examining floras, monographs, maps, historical documents, floral check lists, and plate tectonic and island biogeographical literature in order to determine the most promising exploration sites and time of year to collect wild botanical relatives of the soybean. From January to March, 1977 he made his first of three exploration trips to Australia. Since then, he or his colleagues have made *Glycine* exploration trips to Fiji, Tonga, Vanuatu, New Caledonia, Papua New Guinea, Philippines, Taiwan and the nearby Pescadores Islands, Marianas and Ryukyu Islands, and Japan. Thus far, the genomic relationships of 11 out of 14 currently recognized species in the genus *Glycine* have been elucidated by utilizing cytogenetic, morphological, isozyme and RFLP (Restriction Fragment Length Polymorphisms; see definition below) approaches...

"In 1982, Dr. Hymowitz reported the first successful interspecific hybrid between the soybean and a wild perennial species from Australia, *G. tomentella*... Dr. Hymowitz is the curator of the USDA wild perennial *Glycine* collection at the Univ. of Illinois... Dr. Hymowitz has also taken a keen interest in the history of the soybean and this has led to the discovery of the first introduction of the soybean into North America by Samuel Bowen in 1765. In further historical research he documented that the soybean was first planted in Illinois by John H. Lea in 1851. Subsequently these seeds were disseminated throughout the Corn Belt.

"Dr. Hymowitz has advised 11 students for the M.S. degree and eight students for the Ph.D...

"In 1974-1975 he was a visiting professor at the Hebrew Univ. of Jerusalem, Rehovot, Israel. In 1981 he received the outstanding research award from the Land of Lincoln Soybean Assoc. He is the author or coauthor of more than 200 research articles or chapters in books. The research conducted by Dr. Hymowitz is interdisciplinary, spanning the broad areas of chemistry, genetics, taxonomy, cytogenetics, plant breeding, and history of the genus *Glycine* and many other legumes."

1201. Toriano, Peter. 1989. Japanese food firms cook up new strategies for U.S. consumers. *Economic World*. April. p. 22-26.

• ***Summary:*** "Riding the success of tasty, low-priced food products, the Japanese eye a bigger helping of the U.S. grocery mart." Two of the most popular Japanese food products have been soy sauce, ramen noodles, and tofu. "Nissin sold more Cup O'Noodles in the United States last year than McDonald's sold hamburgers nationally... Japanese food companies and food products are slipping under America's door unnoticed... The Japanese start selling their food products in the U.S. to a small, very concentrated ethnic market... While Kikkoman can trace exports of soy sauce to the U.S. as far back as 1869, most Japanese food companies did not export to or manufacture products in the United States in significant quantities until the 1970s...

"American food product companies focus on their competitors, whereas the Japanese tend to focus on what the customer wants...

"Kikkoman, one of Japan's largest food-related companies, is involved with wines and liquors, pharmaceuticals, health foods and a chain of restaurants. In addition to its other products, Kikkoman has introduced a shelf-stable tofu, instant miso soup and a rice wine for use in cooking.

"Kenzaburo Mogi, planning manager of Kikkoman's foreign operations department, says tofu could become as big a market as soy sauce for Kikkoman in the U.S. in the years to come. In the U.S., Kikkoman also owns 80% share of JFC (Japan Food Corp.), a major distributor of oriental food products... Consumption of Kikkoman's soy sauce has increased fivefold since 1972... On average, each Japanese consumes about 2.5 gallons of soy sauce every year; the average American consumes less than 10 oz...

"Almost a quarter of Kikkoman's total business now is outside Japan: two-thirds in the U.S. and most of the rest in Southeast Asia. The company also is targeting production in Europe, Australia and China...

"Ajinomoto Co, Japan's largest food processor, has been selling abroad since 1909, when its first overseas office opened in New York... Until the 1960s, Ajinomoto's main product was MSG (monosodium glutamate). Today, it has a more diversified line-up, with about 41% of sales coming from processed foods, and 26% from seasonings... The predominant products the firm manufactures in the U.S. are amino acids for pharmaceutical use...

"Kibun Products International Inc., a subsidiary of Kibun Company Ltd. Japan, is a major manufacturer of surimi in the U.S... Kibun is a multi-billion-dollar, 50-year-old food products company with worldwide operations totalling $2,000 million annually...

"Morinaga Nutritional Foods Inc., a subsidiary of Morinaga Milk Industry Co. Ltd., the Borden of Japan, is selling its tofu in air-tight containers that prolong freshness, eliminate water changes and is bacteria-free...

"'This could be the food of the future, replacing dairy and meat as major sources of nutrition," says Kent Cooper, spokesman for Hakuhodo Advertising America Inc. in Los Angeles, which handles Morinaga's account...

"Faith Popcorn, chairman of BrainReserve Inc., a marketing consulting company to Fortune 500 companies says America is eating healthier and is more and more concerned with where food products originate and what that does to the Earth, known as the graining/greening of America. 'Vegetarianism is growing like crazy. Americans are changing from flesh food to health food.'"

1202. *SoyaScan Notes.*1989. What are soybean saponins? Can they reduce human blood cholesterol levels? (Overview). June 28. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** *Webster's Dictionary* (1983) defines saponin (derived from the French *saponine*, which is from the Latin *sapon-*, *sapo* = soap, and first used in 1831) as "any of various mostly toxic glucosides that occur in plants (as soapwort or soapbark) and are characterized by the property of producing a soapy lather; esp: a hygroscopic amorphous saponin mixture used esp. as a foaming and emulsifying agent and detergent."

Thus it may be the saponins (carbohydrates, water soluble sugars) in the whey which is a by-product of the tofu-making process that causes that whey to foam.

Webster's Dictionary defines glucoside (a term first used in 1857) as a glycoside that yields glucose on hydrolysis. A glycoside (first used in 1930) is defined as "any of numerous sugar derivatives that contain a nonsugar group attached through an oxygen or nitrogen bond and that on hydrolysis yield a sugar (as glucose)."

Birk and Peri (1980, p. 161) state: "The saponins are glycosides that occur in a wide variety of plants. They are generally characterized by their bitter taste, foaming in aqueous solutions, and their ability to hemolyze [break down] red blood cells."

The earliest document seen (Jan. 2005) that mentions soybean saponins was published in 1931 by E. Walz in German. In early 1979 a team of Australian researchers (led by Potter, Topping, and Oakenfull) at the CSIRO Division of Human Nutrition in Adelaide found that the cholesterol-lowering effect of soybean products was attributable to the presence of saponins rather than proteins or amino acids. Subsequent research by this group and others seemed to verify this hypothesis. Note that saponins impart an unpleasant, bitter taste to most soyfoods (e.g. tofu or soymilk) in which they are present.

In 1990 Japanese scientists from the Department of Food Chemistry at Tohoku University found that soybean saponins could control reproduction of the HIV virus which is associated with Acquired Immune Deficiency Syndrome or AIDS. These saponins showed inhibitory effects against HIV infection in vitro.

1203. Rumpff, Barbara; Rivera, Esther. 1989. Loma Linda Foods' infant formula line sold to N.V. Nutricia of the Netherlands. New company, La Loma Foods, soon to be sold. (Interview). *SoyaScan Notes.* July 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Loma Linda Foods wanted to start marketing a cow's milk based infant formula, and they were discussing marketing a product made by Nutricia, a Dutch company, which already made Nutri-Soja and Nutri-Soja Plus, two soy-based infant formulas. Nutricia is the second largest infant formula company in Europe behind Nestlé and one of the world's largest companies in clinical nutrition.

In Feb. 1989 the tables were turned and Nutricia ended up buying Loma Linda's infant formula line (Soyalac) as well as both the Riverside and Mt. Vernon, Ohio food factories. Loma Linda decided to sell because of liabilities and stiff competition. Cornelius Rumpff came to head the Nutricia operation in Riverside. The General Conference (GC) of Seventh-day Adventists (the Church, which owns and operates Loma Linda Foods), spun off a new company named La Loma Foods, to market Loma Linda's food line (mostly meat analogs), which was to be made by Nutricia for 18 months until La Loma could build a new plant. But by July 1989 the GC had decided that instead of building a new plant (an expensive project), it would sell La Loma Foods and its food line. Bids would be open during the month of July. It was hoped that another Adventist company would buy the company; both Worthington Foods and Australia's Sanitarium Foods (which had managed Loma Linda Foods for 4-5 years and saved the company from going under) were expected to bid. The infant formula business had been roughly 75% of Loma Linda's total business. The takeover has been low key, not widely publicized. All the formulas and liquids had been made in Ohio. But at one time Loma Linda had made a decision to consolidate the two plants. The Mt. Vernon, Ohio, plant was shut down then reopened because the Riverside plant was not finished in time. Address: 1. Loma Linda Foods, Div. of Nutricia N.V., Riverside, California; 2. La Loma Foods, 12155 Magnolia Ave., Suite 9-B, Riverside, CA 92503. Phone: 714-351-4300 (LLF).

1204. Coffey, Rory. 1989. Lupins as an energy-rich protein source for feed and food. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 410-14.

• ***Summary:*** Contents: Abstract. Introduction. Lupin consumption and usage. Dehulled lupin. Human consumption: Lupin concentrate, miso soup, lupin tempeh, lupin flour.

Miso soup: Although about 200,000 tons of soybeans are used each year in Japan to make miso soup, there is a problem with oxidation, which causes discoloring. The Shinshu Research Institute has investigated the use of lupins as a substitute for soybeans in an attempt to solve this problem. Oxidation does not occur with lupins and to date results have been encouraging. Table 8 shows a sensory evaluation of the two types of miso (high score is more favorable): Color–Lupin 12, soy 0; Taste–Lupin 10, soy 2; Aroma–Lupin 7, soy 5; Texture–Lupin 6, soy 6.

Lupin tempeh: In 1986 an Indonesian company began to investigate the feasibility of using lupins as a substitute for soybeans in making tempeh–with the assistance of the Grain Pool of Western Australia and R. Yu of the Victorian Food Research Institute. Despite some problems at the beginning, the efforts by all 3 parties have proved successful and the Indonesian company is now using a significant tonnage of lupins to make tempeh.

Lupin flour: In 1987, the Grain Pool initiated an evaluation of lupin flour in human food products.

Lupins have been grown and used in Western Australia for over 30 years. After extensive genetic engineering, the composition of the present day varieties is far superior to those grown originally. Over 90% of the lupins grown in Western Australia, and all that are available for export, are varieties from the species *Lupinus angustifolius*, a sweet, white, narrow leaf lupin.

In terms of world lupin production in 1985, Australia has the largest area (606,000 ha), followed by the USSR (280,000), and Europe (148,000). In the USSR and Eastern Europe much of the lupins are grown for forage or green manure; not much grain is not harvested. A photo shows R. Coffey. Address: Grain Pool of Western Australia, Grain Pool Bldg., 172 St. George's Terrace, Perth 6000, Western Australia, Australia.

1205. Dawson, R.J. 1989. Concerns in regulating vegetable food proteins. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 230-33.

• ***Summary:*** "Vegetable food proteins, being nutrients and not additives in most countries are subject to general food legislation, which is based on quality protection, safety, nutritive value and organoleptic criteria. In addition they are subject to regulation for use as food ingredients. There are many countries in the world, e.g., Belgium, Canada, Denmark, Finland, France, Federal Republic of Germany, India, Ireland, Italy, Japan, Luxembourg, Netherlands, New Zealand, Peru, Sweden, U.K., U.S.A. and EEC, which have established national and group regulations for the use of vegetable proteins in food.

Contents: Assessment of the present situation. Codex Alimentarius Commission: It was established as an intergovernmental body in 1962 by FAO and WHO to ensure fair practices in international trade and protect the health of the consumer; It has established more than 200 individual commodity standards. Creation of a Codex Committee on Vegetable Proteins (CCVP) in 1978. Activities of the CCVP: Elaboration of international standards for vegetable protein foods. Codex criteria applicable to commodities: Regulation of the use of vegetable proteins in food, use of VPP [vegetable protein products] for their functional properties, use of VPP to increase content of utilizable protein, use of VPP in partial or complete substitution of the animal protein in foods, use of VPP as sole protein source in products with new identities, quantitative methods for the differentiation of vegetable and animal protein. Address: Food and Agriculture Organization of the United Nations, Via Delle Terme di Caracalla, 00100 Rome, Italy.

1206. Hesser, J.M. 1989. World food uses of vital wheat gluten. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 116-22. Contains 2 pictures and 12 tables. [11 ref]

• ***Summary:*** Contents: Abstract. Introduction: Functional properties: Composition and general properties, Codex Alimentarius International Standard for vital wheat gluten, viscoelasticity, water absorption, pH effects, flavor, nutritional properties, Protein Efficiency Ratio of wheat gluten blended with soy flour in various ratios.

Applications: Milling and flour fortification, bakery products, breakfast cereals, meat, fish and poultry products, pasta, cheese analogs and pizza, nutritional snacks, breadings, batter mixes, coatings and flavorings, pet foods, aquaculture feeds. New applications.

World production, consumption and capacity: Comparison of wheat gluten production by major geographical areas–1980 and 1987, 1987 EEC wheat gluten capacity and production by country, worldwide end uses for wheat gluten in 1980 and 1987. World market: Overview of 1987 supply and trade by major geographical regions, Australian, European and North American wheat gluten consumption by end-use amount (in 1,000 tons) and percent, Argentine wheat gluten demand by end-use, Japanese wheat gluten demand by end-use. Product quality. Acknowledgment. A photo shows J.M. Hesser.

The Protein Efficiency Ratio of wheat gluten is low (only 0.8), compared with 2.0 for soy flour; but a 30:70 blend has a PER of 2.4.

The world's major wheat gluten producing areas in tons (1980 / 1987) are: Europe 29,500 / 132,300 (89% of this is produced in EEC countries), North America (USA, Canada, and Mexico) 30,000 / 54,000, Australia 24,000 / 45,000, South America 2,000 / 7,000, Japan 3,000 / 6,700.

1987 EEC wheat gluten production by country: Netherlands 24,000, United Kingdom 22,500, Germany 22,000, France 20,000, Others 11,800: Total: 118,300.

Changes in worldwide end-use patterns for wheat gluten 1980 / 1987 (percent): Baking 77 / 63, milling (flour fortification) 4 / 14, meats 0 / 5, pet foods 10 / 8, cereals 3 / 2, other 6 / 8.

Overview of 1987 wheat gluten production / net imports / consumption by major geographical regions (tons): Europe (EEC) 118,300 / -20,000 / 98,300, North America 54,000 / 35,600 / 89,600, Australia 45,000 / -26,900 / 18,100, Japan 6,700 / 3,300 / 10,000, South America 7,000 / -2,500 / 4,500. Address: International Wheat Gluten Assoc., 4510 W. 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155 or 1156.

1207. Jolly, Lindsay; Borrell, B.; Perkins, P. 1989. World trade in vegetable proteins in the 1990's. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 10-16. Contains 6 charts and graphs. [17 ref]

• ***Summary:*** Contents: Abstract. Introduction. The vegetable proteins market: Demand for vegetable proteins, supply of vegetable proteins, historical developments. The future for protein meals: Income and population growth in developing countries, changes in policy, European Economic Community, Japan. Discussion.

A photo shows one of the authors. Address: Australian Bureau of Agricultural and Resource Economics, Canberra ACT, Australia 2602.

1208. Thompson, Douglas A. 1989. Application for vegetable proteins in processed pet foods. In: T.H. Applewhite, ed. 1989. Proceedings of the World Congress on Vegetable Protein Utilization in Human Foods and Animal Feedstuffs. Champaign, IL: American Oil Chemists' Society. xii + 575 p. See p. 388-91.

• ***Summary:*** Contents: Abstract. Introduction: The three types of pet food are moist or canned, semi-moist, and dry. Nutrition. Physical properties. Texturization. Price. Cost/performance. Product design.

The worldwide pet food industry produces about 10 million tonnes of prepared pet food valued at over U.S. $12,000 million. A photo shows Douglas Thompson. Address: Uncle Ben's of Australia, P.O. Box 153, Wodonga, Victoria 3690, Australia.

1209. Laboyrie, David. 1989. The Australian soymilk market and Australian Natural Foods Holdings Ltd. (Interview). *SoyaScan Notes.* Aug. 17. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Approximately 8 million liters/year of soymilk are presently sold in Australia. His company, Australian Natural Foods, has 3 basic soymilk products. The first, sold to the health food market, is Aussie Soy, which was launched in June 1987 and now has about 60% of the health food market, around 2 million liters a year. It is in a Tetra Pack container. The other two (Excel and VitaFresh) are designed as milk alternatives, and are fortified with vitamins and calcium. But after about 3 months, calcium fortification (with calcium phosphate and calcium chloride) has an definite undesirable thinning effect on most of the soymilk with the formation of a thick layer of sediment settling to the bottom. They sell through supermarkets, and have a much smaller market share. Sanitarium Foods dominates that market, producing about 100,000 liters/week, or 5.2 million liters/year. David's company makes their soymilk from whole soybeans rather than isolates, and promotes it as such.

Excel was originally launched in Aug. 1987 as a fresh product but it was discontinued in June 1988 due to distribution problems and short shelf life. It is now sold in supermarkets in a UHT pack in plain flavor only. They also make another product (similar to Excel) under another brand for another company. It is called VitaFresh. It has the same settling problem. The existing formula does not contain tri-polyphosphate. They think there is still a big market for fresh soymilk in Australia, but they need either a dairy distributor or a 28-day shelf life. Address: Australian Natural Foods Holdings Ltd., 80 Box Rd., Taren Point, NSW 2229 Australia. Phone: 02-526-2555.

1210. Duchesne, Paul. 1989. History of Wildwood Tofu (Germany), Auenland Tofu, Peter Wiegand, and Wildwood Natural Foods (California) (Interview). *SoyaScan Notes.* Aug. 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** According to Soyfoods Center records, Peter Wiegand started one of the earliest known tofu manufacturing companies in West Germany. Duchesne recalls that Wiegand came to America in the spring of 1981 to learn about tofu. He had heard about Wildwood Natural Foods in Fairfax, so he went there and he and Duchesne quickly became good friends. Duchesne showed him the whole operation and spent a great deal of time teaching him how to make tofu and tofu products. After six months of work and study, in the fall of 1981, Peter and his family returned to Germany. Before Peter left, Duchesne encouraged him to make secondary tofu products, such as tofu sausages. After returning to Germany, Wiegand started his company in a small dairy barn. That winter (early 1982) Michael Pierce, who was once Wildwood's best tofu maker and art designer in Fairfax and who now lives in Georgia (Phone: 912-752-8070), went to Germany and lived and worked with Wiegand. There he made tofu and designed the colorful Auenland label showing a sunrise over a rural village.

Wiegand's first company failed; it was too small and too labor intensive. So he raised a lot of money and built a larger company and plant. Wiegand returned to America and asked Duchesne (who had just left Wildwood Natural Foods) to return with him to Germany to help get the new Auenland started. Duchesne declined (since funds were too limited) but his son, Paul Jr., went and worked there for 6 months. In 1983 Auenland introduced a line of second generation tofu products: Pizza, cake, tofunafish salad, mayonnaise, and burgers, many of which were inspired by Wildwood products. Most of his products were sold in Munich, and some in Austria–where Peter was born. In the end, a sausage maker who worked for Wiegand started a tofu sausage business, bought his tofu from Auenland, and ended making most of the money. Wiegand was not a good businessman, not a very practical person. His father in law was putting a lot of money into the company but in the end Wiegand lost most if not all of it... and the shop. Address: Fairfax, California. Phone: 415-453-2360.

1211. Montague, Sandy. 1989. Asians and soybeans in Australia (Interview). *SoyaScan Notes.* Aug. 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Prior to 1973 the Australian government had a "white Australia" policy that prevented Asians, blacks, and Indians from immigrating. After the racially discriminatory immigration policies were abandoned in 1973 (the year the U.S. lost the Vietnam war and withdrew its troops), the main group of Asians to enter Australia were Vietnamese. Today (according to the *World Almanac)* Asians constitute only 2% of Australia's population. Any any person who now wishes to immigrate must have either money, a skill/occupation, or relatives in Australia. Thus the Asian soyfoods market in Australia is quite small and must cater to Vietnamese.

The key factor in growing soybeans in Australia is the availability and price of water. During the last 2-3 years the price of water has tripled. Thus rice, which requires less water than soybeans, is taking over soybean acreage.

Sandy sells rhizobium inoculants to Australian soybean growers. Three natural foods importers in Sydney import miso; they want organic miso. Address: Nutri-Life, "Teangri" Bethanga, VIC 3691, Australia.

1212. **Product Name:** Tempeh [Sari Ayam–Chicken Flavour].

Manufacturer's Name: Nutrisoy Pty. Ltd.

Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.

Date of Introduction: 1989. August.

Ingredients: Organic soybeans, water, cider vinegar, chicken flavour (salt, maltodextrin, flavour enhancer {621}, wheat starch, chicken fat, chicken meat, beef fat, yeast extract, onion powder, spices), and culture *(Rhizopus oligosporus).*

Wt/Vol., Packaging, Price: 250 gm in plastic bag.

How Stored: Refrigerated.

New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Aug. 1988. Red, green and white on yellow. Front panel: "Delicious. Nutritious. Fitness food. Fry, bake, grill or steam for a quick & easy meal. Fitness food. Bermutu Tinggi."

1213. *SoyaScan Notes.* 1989. Pioneers in vacuum packaging tofu. Its pros and cons (Overview). Sept. 19. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** In late 1977 Redwood Natural Foods Inc. in Santa Rosa, California, became the world's first company to vacuum package tofu. The pioneer there was Greg Hartman (whose photo appears in the Sept. 1983 issue of *Health Foods Business*, p. 80). Redwood used tofu made by Quong Hop & Co. and distributed and sold the organic tofu under their own brand. An illustration of the machine and description of the process is given in *Tofu & Soymilk Production* by Shurtleff & Aoyagi (1984, pp. 23 & 72; In about 1978 Shurtleff & Aoyagi visited Hartman at Redwood Natural Foods and observed his packaging process).

Since that time, many companies have switched to vacuum packaging their tofu. Pioneers in the USA included: Quong Hop & Co. Jan. 1979, Summercorn Foods Sept. 1979, Nasoya Foods 1981, Zakhi Soyfoods 1981, Pacific Trading Co. 1981, Lecanto Tofu 1981, Swan Gardens 1982, White Wave 1983, Farm Soy Dairy 1985, Island Spring 1985.

Pioneers in Europe included: Aros Sojaprodukter in Sweden 1982, Manna Natuurvoeding in the Netherlands 1982, Auenland Tofu in West Germany 1983, Tofuhaus Tiefenthal in West Germany 1983, and Haldane Foods in England 1985.

A few companies (such as Nasoya) have even dropped vacuum packing and switched back to water pack. Companies using relatively small chamber-bag batch-type machines seem happiest with the technology and have had few problems. Companies using larger, continuous process roll-stock machines have often had ongoing, serious problems.

Advantages of vacuum packaging, in approximate order of importance, are: (1) The package is familiar to consumers and it makes tofu look quite similar to cheese, a related and popular food product; first-time tofu users are not turned off by a cake tofu floating in a pale yellow liquid (which reminds some consumers of a fetus floating in formaldehyde in a biology lab). No other food in the western world besides tofu is sold floating in water. Yet the water that surrounds the tofu inside the vacuum pack detracts from its appearance. Some have even said that the resulting package reminds them of a used condom! (2) Because the tofu is packaged without water, it is much lighter and less bulky, which cuts shipping costs and can expand market areas; (3) Nigari-type tofu retains most of its natural sweetness, which is leeched off in water-pack tofu; (4) Vacuum packaging is generally thought to give the product a longer shelf life than water pack. Typical companies date their tofu for an 18-21 day shelf life; (5) The cost of the package itself is less for vacuum packing, BUT the additional labor required for packaging and labeling with a batch-type machine may make the total packaging cost more than for water pack.

Disadvantages of vacuum packaging, in approximate order of importance, are: (1) Most Asian-Americans, especially first generation Asian-Americans, strongly prefer water pack, to which they are accustomed; (2) Vacuum packed tofu is much more susceptible to damage than water-packed tofu in a rigid plastic tub, unless the vacuum pack is surrounded by a fairly rigid box; (3) It is difficult to vacuum pack soft tofu, which is the texture preferred by many Japanese; (4) Unless the tofu is immersed in chilled water for 6-12 hours before vacuum packing, the yellow whey in the tofu may leech out and collect inside the package, giving the tofu a unappealing yellow hue.

One example of a company that has had problems is White Wave Inc. in Boulder, Colorado, which in May 1983 bought a used Tiromat vacuum packager. Thereafter everything went wrong, so much so that that one machine "almost broke the company's back." President Steve Demos later called it "the curse of the Devil," and his production manager would sometimes ask, only half in jest, "Do you think we are sitting in vacuum packaging hell?" Demos notes: "Tofu is a very difficult product to vacuum pack, though firm tofu is easier than soft. In our case, about 30% of the problems have been caused by the machine, 30% by the product, 30% by the operator, and the rest is absolute bad karma. The process was unforgiving, as was the Tiromat's maker, which gave White Wave almost no help." But by Oct. 1989 White Wave had worked the bugs out of their vacuum packing system and now prefers it to water pack.

1214. Pierce, Michael. 1989. Re: Early work with tofu: Wildwood in America and Auenland in West Germany. Letter to William Shurtleff at Soyfoods Center, Oct. 30. 4 p. Handwritten. / or Typed, with signature.

• ***Summary:*** Pierce got involved with tofu while he was in Georgia. He learned to make tofu from a guy in Macon named Pat Powell, who had just gone up to The Farm in Tennessee and learned from Lewis Headrick, who now lives in Northern California. In about Sept. 1980 Pierce went to California and the day he arrived he met Paul Duchesne, who told him his dream of starting a tofu shop. Pierce explained that he already knew how to make tofu, so Duchesne asked Pierce to be the first tofu maker. Pierce moved into the building that is now occupied by Wildwood; it was his apartment. For about the next year, Pierce made tofu sandwiches with Duchesne, until the Wildwood Natural Foods tofu kitchen opened in Sept. 1980, at which time he became Wildwood's first tofu maker. David Patton came down and showed them how to use larger scale equipment than their original 60 quart pot.

"I met Peter and Elgard Wiegand in the summer of 1981 in California. They expressed great interest in returning to Europe and starting a small tofu shop like Wildwood. Peter started working with us at Wildwood, then a few months later, they left for Germany to piece things together.

Around Nov. 1981, Elgard wrote saying they needed me to come soon. A purchased a Mini Might disintegrator from Bean Machines Inc., took two old pressing bags from Wildwood, some recipes and *The Book of Tofu*, and landed in Germany on 1 Feb. 1982. It was snowing a cold. This was the most exciting time of my life. I was the Ambassador of Goodwill and Tofu. Instantly, the Bean King from San Francisco. I was treated with great respect."

There follows a description of the original equipment. "The water came from very deep in the ground. It was cold year round and made the best tofu. The first batch of tofu was magical. We had 40-50 people from all over Germany one night for dinner and a slide show by Wolfgang Furth-Kuby. This batch of tofu was probably the best I ever made. It radiated. That was the fun time. Everyone was charged and everyone wanted tofu. We started selling in bulk... but soon Peter purchased a vacuum pack machine. Then we had a good clean product. It was easier to deal with, people liked it more, and it lasted longer. We made soya milk, but more as a special order. We also made tofu cakes, pizzas, sandwiches, and salads... Peter, myself, and usually some lady with good taste and a talent for cooking would do demonstrations at restaurants, yoga centers, and once at a private sanitarium. We had a lot of fun."

But then things got harder for Peter. There were many expenses but not as much income. Pierce went to India in Feb. 1983 and made some tofu there. When he returned in June Peter had begun building his new kitchen. He had 3-4 large cookers, a new grinder, and a big vacuum packager. But still the financial picture was bad and eventually the company went under. Pierce taught two guys how to make tofu and both bought bits and pieces of Peter's equipment and started their own small tofu operations. "Rolf put together something in Trostberg, West Germany. Herbert, the other guy, went north.

"I know that Peter became very unstable. He lost everything, including his wife and kids. He is now working odd jobs painting houses, trying to keep his head up and pay off his debts. He really worked hard but he lost his spirit. Peter had a very hard life. Pleas give Peter and Elgard a lot of credit for helping tofu get started in Europe. They worked so hard and got nothing to show for it. They are truly beautiful, caring people. I love them both dearly. Their vision was pure. We just didn't have much on the business end."

Peter's address is presently Kampenwandstr. 25, 8213 Aschau, W. Germany. Phone: 08052-2967. Note: In Nov. 1989 Peter Wiegand reviewed all information on his work and stated, in a touching letter, that it was all correctly reported. "The whiteness and pureness of tofu brought out one of my darkest sides that I really didn't know before."

Update: Talk with Michael Pierce. 1993. Dec. 8. Rolf Barthof's (Prabuddha) tofu company in Breitbrunn is doing very well. Peter Wiegand is a rock musician in Germany. Address: Graphic designer, 408 2nd St., Macon, Georgia 31201. Phone: 912-752-8083.

1215. Singh, R.J.; Kollipara, K.P.; Hymowitz, T. 1989. Ancestors of 80- and 78-chromosome *Glycine tomentella* Hayata (Leguminosae). *Genome* 32(5):796-801. Oct. [27 ref]

• ***Summary:*** The authors demonstrate that the allopolyploidization of *Glycine* species (2n = 80) took place in Australia. *Glycine canescens* and *G. tomentella* were collected a sites throughout Australia. Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1216. **Product Name:** Tofu.
Manufacturer's Name: Tofu Shop Ltd.
Manufacturer's Address: 89 Dominion Rd., Mt. Eden, Auckland, New Zealand.
Date of Introduction: 1989. October.
New Product–Documentation: Call from Ron Hoyfong, owner, from New Zealand. 1993. June 2. He is a Chinese New Zealander. The company started in about Oct. 1988 or 1989. He began by selling to Asian restaurants and retail stores then about 2½-3 years ago began to sell to typical retail customers. The Tofu Shop now makes about 6,000 kg/week of tofu. He also makes the tofu for Bean Supreme using his workers and making it in their factory. He and Bean Supreme have a non-compete agreement, which began 6 months ago. A major problem is the many Asian immigrants to New Zealand, a few of whom start tofu shops in their back yards, without proper sanitation, and sell it at very low prices so the owners can survive financially.

1217. **Product Name:** Organic Tofu.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1989. December.
Ingredients: Certified organic soybean (non genetically modified), filtered water, natural nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 350 gm and 750 gm.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in Dec. 1989. Orange, white, black and green on red.

1218. **Product Name:** Tofu (Fresh).
Manufacturer's Name: Nutrisoy Pty. Ltd.

Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1989. December.
Ingredients: Soybeans, natural nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 500 gm.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Dec. 1989. Red, blue, green, yellow and light blue on white. This product is targeted to the Chinese market. On the front panel in large white letters on a red background is written Doufu-gan. Fresh.

1219. **Product Name:** So Good Soya Milk [Regular, or Sugar-Free Organic].
Manufacturer's Name: Haldane Foods Ltd. (Importer-Distributor). Made in Australia by Sanitarium Foods.
Manufacturer's Address: 25 Hayhill, Sileby Road, Barrow upon Soar, Leicestershire LE12 8LD, England. Phone: 050981-6611.
Date of Introduction: 1989.
Wt/Vol., Packaging, Price: 1 liter Tetra Brik Aseptic carton. Retails for £0.69.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Haldane Foods Group catalog and price list. 1989. Oct. 2. This product is listed in both documents under the Haldane Foods Ltd. product line. A color photo in the catalog shows the label (1 liter carton). It has black lettering and vertical stripes on a white background. On the front panel is am impressionistic sketch of a snow-capped mountain in the distance with several soybean plants growing in the immediate foreground.

Talk with Philip Marshall of Cauldron Foods. 1990. July 9. Haldane's soymilk used to be called Sojal. They may have lost the fight over the name. It is very likely that the Haldane group has this product made by some company outside of the group. They do not have the equipment needed to make a quality soymilk. There is no connection with Sanitarium Foods in Australia.

1220. Kumar, P.S.; Hymowitz, T. 1989. Where are the diploid ($2n = 2x = 20$) genome donors of Glycine Willd. (Leguminosae, Papilionoideae)? *Euphytica* 40:221-26. [21 ref]

• ***Summary:*** "There are about 16 genera in the subtribe Glycininae, tribe Phaseoleae, family Leguminosae. The overwhelming reason for the economic importance of the subtribe Glycininae is due to the cultivated soybean, Glycine max (L.) Merrill. The soybean, its wild annual counterpart and most of wild perennial members of the genus Glycine carry $2n = 40$ chromosomes. It is reasonable to assume that the base number of the genus is $x = 10$. However Glycine plants carrying $2n = 20$ have not been reported. Herein we report on the 2n chromosome situation of the remaining 15 genera in the subtribe Glycininae and two genera *(Galactia, Ophrestia)* once thought to be allied with Glycine. Certain species in *Dumasia, Galactia* and *Ophrestia* were found to carry $2n = 20$ chromosomes. All the other genera carry $2n = 22$, 28 or 44 chromosomes. The 2n chromosome number of *Teyleria* (44) and *Pseudeminia* (22) is being reported for the first time."

The subgenus *Glycine* contains 12 wild perennial species. Ten of the species are "indigenous to Australia and carry $2n = 40$ chromosomes. *Glycine tabacina* (Labell.) Benth. with $2n = 40$, 80 chromosomes, has been found in Australia, Taiwan, South Pacific Islands (New Caledonia, Fiji, Tonga, Vanuatu) and West Central Pacific Islands (Mariana, Ryukyu [southern Japan]). All accessions of *G. tabacina* collected outside of Australia are tetraploid ($2n = 80$) and even within Australia, tetraploids predominate over the diploid forms. *Glycine tomentella* has been found in Australia ($2n = 38$, 40, 78, 80), Papua New Guinea ($2n = 40$, 78, 80), Philippines ($2n = 80$), and Taiwan ($2n = 80$). Singh et al. (1987) demonstrated that the complexes of *G. tabacina* and *G. tomentella* evolved through allopolyploidization." Address: Dep. of Agronomy, Univ. of Illinois, 1102 S. Goodwin Ave., Urbana, IL 61801.

1221. **Product Name:** Sanitarium So Good: Flavoured Non-Dairy Soy Drink [Strawberry, Jaffa {Chocolate & Orange}, Honeycomb, or Caramel].
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia.
Date of Introduction: 1989.
Ingredients: Jaffa: Water (80.0%), soya isolate (3.7%), sugar (3.7%), vegetable oil 3.2%, maltodextrin 2.8%, fructose (1.7%), mineral salts, vitamins, flavours, food acid, colour.
Wt/Vol., Packaging, Price: 250 ml Combibloc Aseptic carton. Retails for $0.75 (10/93, Walnut Creek, California).
How Stored: Shelf stable; refrigerate after opening.
Nutrition: Per 250 ml.: Calories 178 (or 750 kJ), protein 8.0 gm, fat 8.0 gm, carbohydrate (total 19.7 gm, sugars 13.7 gm, lactose 0 gm), cholesterol 0 gm, sodium 137 mg, potassium 350 mg. Provides 40% of the Daily Allowance of calcium and 35% of vitamin B-12.
New Product–Documentation: Letter and Labels sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1989.

Sanitarium Nutrition Education Service. 1990. April. "So Good." This 4-page leaflet gives a clear explanation of each ingredient used, plus nutritional and other information.

Product with Label (Jaffa and Strawberry flavors) purchased at Diablo Oriental Foods in Walnut Creek, California. 1993. Oct. 11. Each retails for $0.75. 3 inches by

3 inches by 1.87 inches thick. Jaffa: Brown, reddish brown, orange, pink, blue, and red on white. Illustration of a large glass of pink soymilk with a straw in it. Beside it is an orange and two squares of chocolate. Behind it is the morning sun rising over purple mountains and green fields. Front panel: "Long lasting. No cholesterol. No lactose." Back panel: "So Good is an excellent source of protein. A 250 ml serve of So Good supplies 8g of vegetable protein. Another quality product from the Sanitarium Health Food Company–the people who believe that food should not only taste good, it should be good for you." Side panel: "So Good has no cholesterol, no lactose, and as much calcium as milk. Quality Guarantee: If you are not satisfied with this product, please send the top of the pack with your complaint to SRL Consumer Services... or to the nearest Sanitarium State office." Soyfoods Center taste test. Excellent. No beany flavor at all.

1222. Tindale, Mary D.; Craven, Lyn A. 1989. Three new species of *Glycine* (Fabaceae: Phaseolae) from northwestern Australia, with notes on amphicarpy in the genus. *Australian Systematic Botany* 1(4):399-410. [12 ref]
• ***Summary:*** The genus *Glycine* Willd. is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The subgenus contains 15 wild perennial species. Three new species of *Glycine* Willd., viz. *Glycine albicans, G. lactovirens* and *G. hirticaulis* from northwestern Australia are described and illustrated.

Note: This article was not published in 1988. Address: 1. Royal Botanic Gardens, Mrs Macquarie's Rd., Sydney, New South Wales 2000, Australia; 2. Australian National Herbarium, Div. of Plant Industry, CSIRO, G.P.O. Box 1600, Canberra, Australian Capital Territory 2601, Australia.

1223. *Good Food News (Nutrition Education Service, Sanitarium Health Food Company, Australia).* 1989—. Serial/periodical. New South Wales, Australia: Sanitarium Health Food Co. Frequency: Quarterly.
• ***Summary:*** Contains information about healthy (largely vegetarian) eating, with recipes that use products made by Sanitarium Health Food Co. The format changed in Sept. 1997 (vol. 9, no. 3) by adding 2 more pages and including a "New Products" section.

Some new soy products and the dates mentioned: Sept. 1997–Crispy Nuggets, Country Burgers, Seafarers Patties, Potato Pockets. Dec. 1997–So Good Now (chilled soy beverage in gable-top cartons, regular and low-fat), Weet-Bix Hi Bran with Soy & Linseed. March 1998–So Good Smoothie (Mango, or Banana). June 1998–Soyaccino (cappuccino-style So Good soy drink), Up & Go (Liquid Breakfast). Sept. 1998–Today's Gourmet: Cacciatore Kiev. Dec. 1998–Fat Free So Good. March 1999–So Good Plus (calcium + linseed oil). SoyHealthy: Eight chilled (incl. Original Soy Slices) and five frozen (incl. Tender Soy Schnitzels, Country-Spiced Burgers). Sept. 1999–So Good Ab+ (Soy Yoghurt with Acidophilus and Bifidus, in Strawberry, Apricot & Mango, and Passionfruit flavors). Address: 146 Fox Valley Road, Wahroonga, NSW 2076, Australia. Phone: (02) 487-1711.

1224. Sanitarium Health Food Co. 1989? Sanitarium: The people who believe food should not only taste good, it should be good for you! 148 Fox Valley Rd., Wahroonga, NSW 2076, Australia. 8 p. Undated. Manufacturer's catalog.
• ***Summary:*** Contents: Background. Manufacture. Retail. Export. Products.

In the late 1800s a group of immigrants from the USA, all of whom were members of the Seventh-day Adventist Church, decided to make their living by distributing health foods. At first they imported a selection of products from Battle Creek, Michigan, then famous for its sanitarium. The first products arrived in Melbourne in 1897. They included Granola, Caramel Cereal, and gluten products. But when demand outstripped supply, in late 1897 a baker, E.C. Halsey, was persuaded to migrate to Australia to start up a manufacturing plant similar to the one he had operated in Battle Creek. On Nov. 8 he arrived in Sydney en route to Melbourne, totally unaware of what he was starting. The records show that the St. George's Bakery was rented in Melbourne in 1898. The production of Caramel Cereal and Granola commenced immediately.

In 1898 the group moved to larger premises in Cooranbong, a rural area south of Newcastle in New South Wales, and adopted the name Sanitarium Health Food Company. With Halsey in charge, production commenced in a large defunct sawmill in 1899. After a period of uncertainty, the Company grew and expanded until today, it has manufacturing plants in all states of Australia, in both islands of New Zealand, and in Papua New Guinea. In about 1906 the company's first retail shop opened in the Royal Arcade, Sydney. Many of the early shops included a vegetarian restaurant. Today the company operates some 70 retail shops. It also has an export division in Sydney. In 1935 the Australasian Food Research Laboratories were started. Located on the spacious grounds of the Cooranbong plant, they new employ a staff of nearly 40 people. Photos show the original Cooranbong factory, early products (incl. Nut Meat, Protose, Weet-Bix, Corn Flakes, and Marmite yeast extract), and today's food factories at Cooranbong, Victoria, and Palmerston, North New Zealand.

Product lines include Cereals (The company's leading product is Weet-Bix, the most popular breakfast cereal in Australia and New Zealand. It was first manufactured under the Sanitarium name in the mid-1920s, and comes in the shape of little biscuits. Other well known brands are Granose, Bran-Bix, and Sanitarium Skippy Cornflakes), Juices and Drinks (So Good, a non-dairy soy drink, is the newest introduction), Spreads (such as peanut butter and Marmite), Muesli Bars, Specialty Lines (such as dried fruits), Canned Protein Foods (all vegetarian, such as B-B-Q Links, Tender Bits, Vegetarian Rediburger, and Nut Meat), and Sundried (incl. TVP products, and Caffex coffee substitute); a color photo shows all of these.

The name and address of the company's head office, export division, and various food factories and retail outlets is given. Address: Wahroonga, NSW, Australia.

1225. Smith, Preston. 1990. Agriculture's free trade advocate: How Aussies deal with fewer subsidies. *Soybean Digest.* Jan. p. 28d-e.

• ***Summary:*** "At this Senate confirmation hearing, Secretary of Agriculture Clayton Yeutter, who might consider himself the epitome of free-traders, said, 'We need to break the bonds between government and agriculture.'...

"During his last three years as U.S. Trade Representative, Yeutter headed up the U.S. proposal to the General Agreement on Tariffs and Trade (GATT) to phase out all trade-distorting agricultural subsidies worldwide. But no matter how bold this proposal is, Yeutter has reiterated that the U.S. will not 'unilaterally disarm' its agricultural subsidies until everybody else does.

"If the U.S. were looking for a model of free enterprise and trade–and one that shows a unilateral phase-out of subsidies–it could easily look to Australia. In 1982, the Australian government decided to deregulate its industries, such as banking, shipping and agriculture. In short, Australia has decided not only to speak free trade, but also to phase out farm subsidies, regardless if any other country does...

"A 1987 Economic Research Service study says Australia had one of the lowest producer subsidy equivalents (PSE) in the world. PSE is the portion of farmers' gross income that comes from government assistance... During 1982 to 1986, Japan had an average PSE of 72%, the European Community was at 35%, Canada 31%, the U.S. and New Zealand each 25% and Australia 11%...

"In 1901, Australia gained independence from Britain... Unlike the U.S., where programs date from the 1930s and have grown in the 1980s, the Australian key farm programs started in the late 1950s and faded in the 1970s."

1226. **Product Name:** Soyjoy Tofu.
Manufacturer's Name: Soyfoods Australia Pty. Ltd.
Manufacturer's Address: 14/2 Paton Place, Manly Vale, NSW 2093, Australia. Phone: (02) 949 7314.
Date of Introduction: 1990. January.
Ingredients: Soybeans, nigari (a natural seawater extract), water.
Wt/Vol., Packaging, Price: 300 gm, with plastic film lid. Retails for $1.60 (12/90).
How Stored: Refrigerated.
New Product–Documentation: Label sent by Tony Cooper. 1991. Jan. 25. 4 by 5 inches. Blue and red on clear plastic film. Logo of 4 soybeans in a circle showing hilums. "Organic. Product of Australia. No cholesterol. No preservatives. Low kilojoules. Low sodium. High quality vegetable protein. Keep refrigerated. After opening, cover with water. Change water every 2nd day."

Form filled out by Jennifer Young. 1991. March. She bought this business on 1-7-1990 (probably 1 July 1990). The company is Great Australian Tofu Pty Ltd., trading as Soyfoods Pty. Ltd. Phone: 612-949-7314. Fax: 612-588-1502. She does not know if this company was ever related to another tofu manufacturer named Soyfoods Australia, located in Leichhardt, NSW, of which Marcea Newman was once an owner.

Letter from Marcea Newman Weber. 1995. Feb. 12. "I started Soyfoods Australia first and then we changed owners and decided to change names and locations. Soyfoods Australia only made tofu, and now that company is probably The Great Australian Tofu Pty. Ltd., trading as Soyfoods Pty. Ltd."

1227. Down to Earth Natural Products Ltd. 1990. Some companies start out really small and then... they grow! (Leaflet). Penrose, Auckland, New Zealand. 2 p.

• ***Summary:*** "Which is why we've changed our name from Bean Supreme to Down to Earth–to make room for things to come.

Bean Supreme will remain as the brand name for our existing and expanding range of traditional soy products–Tofu and Tempeh.

"Our new company name Down to Earth Natural Products Ltd reflects our intended diversification into new areas of product development and marketing. We believe the name will speak directly to our core group of consumers, those with increasingly convergent interests in health and the environment.

"Our first product launch [soymilk] under our new name is imminent. In fact we'll send you some in the post! Until then–goodbye from Bean Supreme. More to follow from Down to Earth.

"From the directors–Paul and Trevor Johnston and all of the team, best wishes for 1990."

Brands: Bean Supreme, Nice 'n' Healthy, Lite Licks, Bio Farm, Spiral Foods. Address: Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: (09) 590 592.

1228. Karty, Cheryl. 1990. Soy drink sales rise fast [in Australia]. *Retail World (Australia).* Feb. *

• ***Summary:*** Australia's 16 million inhabitants consumed about 25 million liters of soymilk, and the market is growing at 20-25% a year. There are now at least 8 companies making soymilk in Australia; three of these are dairy companies. There are roughly 100 different flavors, packaging types, and sizes. All supermarkets now carry soymilk.

1229. Fehlberg, Eric C. 1990. Recent Seventh-day Adventist work with soymilk (Interview). *SoyaScan Notes.* March 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** So Good soymilk from Australia has had remarkable success since it was launched in April 1987. Sanitarium Health Food Co. was the first to make soymilk in Australia. It caught on rapidly, and soon prompted 4-5 competing brands to be launched, but none of them have sales nearly as large as So Good. The main problem has been the company's inability to produce enough to keep up with demand. It was launched in about April 1987. In Oct. 1989 they sold 1,738 long tons (2,240 lb/ton, thus 3,893,120 lb). The equipment used to produce the soymilk is Adventist technology, not that purchased from Alfa-Laval, STS, etc. although in the last 6 months Sanitarium Foods purchased a pilot plant from Alfa-Laval which they plan to use in their laboratory. Originally So Good was packed under contract by a nearby dairy company in Combibloc cartons. After a year or so they purchased their own Combibloc packaging machine. Australia started to make soymilk after DE-VAU-GE in West Germany. The latter is very happy with their STS system, and Fehlberg is now seriously considering ordering one or two more turnkey soymilk plants for other countries in the near future. Sanitarium Foods has a very strong research lab.

The Seventh-day Adventist food company in South Korea, Sahm Yook Foods, now makes a Tetra Pak soymilk. The company was established in 1978, but did not begin food production until Sept. 1981. It began to make Sahm Yook Soy Milk in May 1985. Only a plain soymilk is produced–no flavors. After launching soymilk, the company began to grow dramatically, as that product grew. Last year they built a very large, now soymilk plant (based on Adventist technology) and they are now about the 2nd or 3rd largest soymilk maker in Korea. Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

1230. Fehlberg, Eric C. 1990. Thoughts on Loma Linda Foods, its acquisition by Worthington Foods, and the health foods industry in America (Interview). *SoyaScan Notes.* March 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Worthington Foods purchased Loma Linda Foods (LLF) from the Seventh-day Adventist Church in Jan. 1990. Loma Linda Foods, unlike most other Seventh-day Adventist companies worldwide, tended historically to target its products to Seventh-day Adventists. Within North America there are very, very few respectable SDA businessmen. That is the problem. "Loma Linda has been working since 1906 with their eyes blindfolded. Too often, instead of using a businessman to head the program, the men in their wisdom have elected to install a broken down minister, and expected him to make a roaring success of it."

A very good businessman, George T. Chapman from Australia, ran LLF from 1938 to 1963. The company did very well financially under his leadership. Since 1963 the company has had a series of managers who lacked business experience; the result was ongoing financial problems. In June 1984 Mr. Fehlberg went from his position at the General Conference to Loma Linda where he turned the company around. Fehlberg ran LLF for about 2 years, during which time it went from a substantial loss to a very profitable company. Mr. Pizzaro was brought in Nov. 1984 and has kept it profitable. He is a very conservative man with a background in banking. He was able to hold LLF together but was not inclined to take the risks to make it really take off.

The church first wanted to sell off the infant formula part of the company because of the high cost of liability insurance. The FDA are really down on infant formula foods. If anything goes wrong, there is no end to the strife. LLF had one small recall due to a small shortage of vitamin A–from dissipation. It was very expensive. Fehlberg understands that but does not understand at all and strongly disagreed with the sale of LLF. "I talked myself hoarse on the committee opposing the sale but I didn't win. I am not happy that it ended up in the hands of Worthington Foods. Their financial report over the past 5 years is not that strong. The last year has not been a healthy year. I hope they can survive. Loma Linda will definitely help them survive by giving them a lot of extra new sales with no extra administration or marketing costs. Now that they have a monopoly, they may relax their standards. I believe that once the 5-year non-compete term expires, you'll get an influx of products into the United States from Adventist companies overseas that will make it very difficult for Worthington to operate–unless they can improve things. Fehlberg prefers the flavor the Australian meat analogs, which are less highly flavored and easier to digest.

Fehlberg feels that the USA is 20 years behind many other countries (Australia, West Germany, Japan) in food processing and storage techniques, largely because of Food and Drug Administration (FDA) restrictions. One area where the USA lags behind is in retorting of food products in plastic film containers. We tend to retort foods too long, and do not have foods retorted in sausage-type pouches (e.g., tofu sausages), which require no refrigeration. The FDA is afraid of botulism in such protein foods, so they require that the foods be frozen. In Australia, West Germany, and Japan these foods are refrigerated, but Adventist tests show they can be stored at room temperature for 6-12 months, or more. If Worthington's frozen meatlike products could put in plastic containers made of this special film (which is available in America) there would be major cost savings in factory storage, transportation, and retail storage. Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

1231. Karas, Thomas. 1990. The tofu industry and market in West Germany (Interview). *SoyaScan Notes.* March 14. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Soyastern/Dorstener Tofu Produktions (DTP) makes about 7,000 kg/week of tofu. Thomas thinks DTP is still the largest tofu manufacturer in West Germany, but he is not sure. In the natural foods trade, the other big competitor is Yamato; DTP is definitely larger than Yamato. He is quite sure that DTP produces more tofu than TKW. TKW has a big tofu plant and large scale equipment (they are a machine manufacturer) but they don't seem to sell much because they don't use organically grown soybeans, which are absolutely necessary to sell tofu.

He thinks DTP is also bigger than Hensel, but he is not sure. Heirler does not make regular (firm) tofu. Instead, they make special soy products, especially soy yogurt and silken tofu, plus some Tofu Pastete. Heirler is mainly a distributor of dairy products, and the biggest distributor of fresh natural foods in West Germany. He distributes the whole fresh program, including produce/vegetables, and soy products exclusively to the Reform Houses. He does not distribute to natural food stores (Naturkostlaeden, Biokostlaeden). The company does about DM 50 million in sales/turnover a year in West Germany, and about DM 10 million in other countries. Heirler's tofu is made by a dairy company named KMK (Kurhessische Molkerei Kassel) in Kassel. The dairy products he distributes are made in the same plant. The brand name is Soja Soft. KMK also makes tofu for Hensel, but KMK does not sell its own tofu. Heirler and Hensel work together. Heirler distributes the Hensel tofu. Originally Hensel tofu was made by Yamato, then Auenland, then Soyastern, and now KMK. Heirler has always wanted Hensel to expand their line of tofu products. But Hensel is very conservative and slow to act, so Heirler introduced its own line. Hensel is an old soyfoods manufacturer.

So the big 4 tofu makers in West Germany, in descending order of size, are probably Soyastern, Yamato, Heirler, and Hensel. But this will soon change because of DE-VAU-GE (DVG), and Huegli-Heirler-Yamato. DVG does not yet make their own tofu. They buy it all from Heuschen-Schrouff in the Netherlands. Soyastern has sold them tofu in the past. However in about June 1990 they will start to make their own, and they will probably become a big force in the market because they sell a lot of tofu now and they have excellent distribution to the Reform Houses. About 89% of their products are sold to Reform Houses. Martin Evers is the only distributor of DVG products to natural foods stores. DVG is a very big company and is very slow in making decisions.

When Huegli bought Heirler and Yamato, Heirler put half of the money he got from the sale back into Heirler and half into Huegli in the form of stock. Mr. Heirler is now on the board of directors of Huegli. Thomas talked with Mr. Heirler at length in Dec. 1989. His thinking is very much oriented toward the open market in Europe after 1992. Huegli is basically a producer for the Reform House market. His two brands are Neuco and Cenovis. The tofu used in the Neuco tofu salads is not yet made by Yamato; it is probably made by Witte Wonder in the Netherlands.

So West Germany's two biggest tofu company's will probably soon be DVG and Yamato-Heirler-Huegli. With the opening of Europe in 1992, some companies will decentralize/regionalize their business for reasons of ecology and freshness. Soyastern is too big for this. The other is the path that Huegli-Heirler-Yamato are taking, by merging and trying to distribute and sell products throughout Europe. Heirler is the perfect company for expanding distribution outside of Germany. They may be the best in Europe for refrigerated distribution; they also have a little frozen distribution. They now distribute some to Switzerland, Belgium, Austria, and East Germany. After 1992 this distribution will grow rapidly. Address: Bochumerstr. 92-104, D-4270 Dorsten, West Germany. Phone: 2362-26801.

1232. Doyle, Jeff J.; Doyle, Jane L.; Brown, A.H.D. 1990. A chloroplast DNA phylogeny of the wild perennial relatives of soybean *(Glycine* subgenus *Glycine):* congruence with morphological and crossing groups. *Evolution* 44(2):371-89. March. [62 ref]

• ***Summary:*** This is the earliest document seen (one of two studies) that uses molecular studies to establish genomic relationships among the wild perennial *Glycine* species. The researchers used restriction site variation in chloroplast (cp) DNA to infer phylogenetic relationships among the *Glycine* species. Fig. 2 (p. 377) shows "One of the most-parsimonious cladograms [pronounced CLAY-duh-grams], showing relationships among perennial *Glycine* taxa and the distribution of the characters in Table 2." Fig. 3 (p. 382) is an "Unrooted phylogenetic network calculated by the Fitch-Margoliash method..." Fig 5 (p. 385) shows a "Comparison of hypothesized relationships based on genome analysis with those based on cpDNA variation..." Address: 1-2. L.H.

Bailey Hortorium, 462 Mann Library Building, Cornell Univ., Ithaca, New York 14853; 3. CSIRO Div. of Plant Industry, Canberra A.C.T., Australia.

1233. **Product Name:** Stir-Fry Sauce, Stir Fry Spicy Sauce for Seafood, Chinese BBQ Sauce, and Steak Sauce.
Manufacturer's Name: Merrychef Foods SDN BHD.
Manufacturer's Address: 118A Jalan Burhanuddin Helmi, Taman Tun Dr., Ismail, 6000 Kuala Lumpur, Malaysia. Phone: 03 719-7540.
Date of Introduction: 1990. April.
Wt/Vol., Packaging, Price: 250 gm glass bottles.
How Stored: Shelf stable.
New Product–Documentation: Spot in SoyaFoods. 1991. Spring. p. 4. "Stir fry sauces from Merrychef." "Merrychef Foods produces a whole range of sauces for Western and Oriental cooking, most of which are exported. Their 'Chinese' range of 'stir fry,' 'BBQ,' and steak sauces are mainly based on soya and have been available in the UK for about a year and in Australia, Japan and Germany for a few months. Merrychef hopes to export to the U.S. this year as well as to supply the home market... Varieties include stir fry for meat, vegetables, sea food, Chinese BBQ and steak sauce."

1234. Sanitarium Nutrition Education Service. 1990. Information for health professionals. Sanitarium So Good Non-dairy Soy Drink. Sanitarium Health Food Co., P.O. Box 249, Wahroonga, NSW, 2076, Australia. 8 p. April. 30 cm. [3 ref]
• ***Summary:*** Contents: Introduction. Ingredient description. Nutritional analysis. Suitability for special diets. Directions for use. So Good for babies. Typical nutritional profiles. Nutritional aspects of So Good. Address: Wahroonga, Australia. Phone: (02) 487 1711.

1235. Sanitarium Nutrition Education Service. 1990. So Good (Brochure). Sanitarium Health Food Co., P.O. Box 249, Wahroonga, NSW, 2076, Australia. 4 p. April. 30 cm.
• ***Summary:*** Contents: The amazing soya bean. The So Good story. Package size. Nutritional information. Ingredient description: Soya isolate ("extracted by sequential treatments of soya flour with alkali and acid solutions"), maltodextrin (derived from wheat or corn starch which is partially hydrolyzed with enzymes and/or acid; it contributes dextrose), corn syrup solids, sugar (sucrose; white/unflavored contains 1.6%, flavored 3.6%, lite 0%), vegetable oil (sunflower oil; it accounts for 3.4% of the fat level in So Good (white), 3.2% in the flavored varieties, and 0.7% in So Good Lite. All So Good products are free of cholesterol and lactose), vitamins and minerals ("The addition of vitamins and minerals is aimed at providing an equivalent level to that of full cream dairy milk.") Note that a major problem in fortifying soymilk with calcium is how to keep it from coagulating; So Good uses calcium chloride [509] and calcium oxide [(529]), flavors and colors (Flavored products use a combination of natural and artificial flavors. For example, Jaffa flavor uses natural orange and artificial chocolate flavors, plus Sunset Yellow color).

Nutritional analysis. Suitability for special diets. Directions for use. So Good for babies (So Good white is not recommended for babies under the age of 12 months; So Good Lite is not recommended for babies under the age of 2 years because of the low fat content). Gives five recipes. Address: Wahroonga, Australia. Phone: (02) 487 1711.

1236. Gaiser, Klaus. 1990. Impressions of the German Soyfoods Association meeting in Hamburg, and of the outlook for Soyastern (Interview). *SoyaScan Notes.* May 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The association was originally founded so that tofu companies could join together to make a "positive profile" and give consumers the confidence that when they buy tofu from a member of the association, they are buying a "traditional, honest product, and there are no foreign or undesirable ingredients used in it." There are unsubstantiated rumors that some large European tofu makers use undesirable ingredients.

The main issues that emerged were small versus large tofu companies, and traditional handcrafted versus modern industrial tofu products. Klaus and Thomas Karas (of Soyastern) turned out to be the main speakers. At the previous meeting of the association, they were both absent, accidentally. The smaller companies realized that they were afraid of the power of Yamato and Soyastern. This time they tried to find common needs and a basis for marketing their products. In the end Klaus and many others felt they had very little in common. The small companies were still afraid of Soyastern and Yamato, and all were afraid of bigger companies like Heuschen- Schrouff. Yet many smaller companies (as in Munich, Berlin, Hamburg, and in the Ruhr area around Cologne) are making good profits making second-generation products and using direct delivery. But the others did not want to make common promotional efforts with Yamato and Soyastern. There was much discussion over use of the terms "traditional" and "handcrafted" in the names of tofu products made by larger scale industrial equipment. There was much checking to see that all members produce according to the association's rules. There will be another meeting of the association in about 2 weeks to decide whether or not they will continue the association.

Klaus feels that the question of whether or not Soyastern will be able to survive depends a lot on what Huegli does with Yamato. Thomas told Klaus that Soyastern's situation is looking a lot better because he took a lot of measures to survive and make his production more rational. But he still hasn't found the money or investor(s) that he needs. Up until now Yamato and Soyastern have been bitter enemies and fierce competitors, but since they joined the association they "stopped the war." Of course they still compete but now the feeling is much better. If the association disbands, Klaus would like to continue it with Thomas to try to expand the tofu market.

Thomas Karas is probably the best informed on the tofu industry in West Germany. He is one of the few people who really understands the need to create a strong tofu association and to get as many members as possible to join–since non-members will also benefit from all association promotional activities.

There are two tofu companies named Byodo Naturkost. They must have separated one day. One is a wholesaler and the other makes tofu in Munich. The one that makes tofu was sold several weeks ago to a butcher (whose name Klaus does not recall). Tomas Jakobi went out of business a year or so ago; a woman bought his company, maybe Jutta Schoenemann. Auenland, thanks to God, no longer exists. Morgenland still exists. For a year or so Alexander Nabben has been trying to get the poor company back on its feet but he is having a hard time. Atlantis still exists but is very small and wants to stay small. You never hear anything about them. Address: President, Yamato Tofuhaus GmbH, Rittweg 11/1, D-7400 Tuebingen–Hirschau, West Germany. Phone: 7071-71094 or 95.

1237. Fehlberg, Eric C. 1990. Re: List and activities of Seventh-day Adventist health food companies worldwide. Letter to William Shurtleff at Soyfoods Center, May 24. 6 p. Typed, with signature on letterhead.

• ***Summary:*** For each for the following companies is given the date of founding, date manufacturing started, and the soy products presently manufactured: Granovita, Spain. Nutana, Holland. Nutana, Norway. Nutana name changes. Austrian Food Company. DE-VAU-GE, West Germany. Sahm Yook Foods, Korea. Sanitarium Health Food Company, Australia (3 pages).

Lists (with addresses) the following companies: Sanitarium Health Food Company in Wahroonga, NSW, Australia; DE-VAU-GE Gesundkostwerk GmbH in Lueneburg, West Germany; San-iku Foods in Sodegaura-machi, Kimitsu-gun, Chiba-ken, Japan; Korean Food Factory (Sahm Yook Foods) in Choongchungnam-do, South Korea; Alimentos Integronaturales y Panificadora la Carlota in Montemorelos, N.L., Mexico; Produtos Alimenticios Superbom Industria e Comercio Ltda. in Sao Paulo, Brazil; Alimentos Granix in Florida, Buenos Aires, Argentina; Nutana Health Food Company in Bjaeverskov, Denmark; AB Svenska Nutana in Rimbo, Sweden; Granose Foods Ltd. in Newport Pagnell, Bucks, England; Pur-Aliment Food Factory in Clichy–Cedex, France; PHAG Food Factory in Gland, Switzerland (Note: PHAG is an acronym for Produits Hygièniques Alimentaires Gland); Egypt Food Factory in Heliopolis, Cairo, Egypt; Glaxo India Limited in Bombay, India; Westico Foods Ltd. in Mandeville, Jamaica; Industrias Covac S.A. in Alajuela, Costa Rica; South China Island Union Mission in Hong Kong (3 pages). Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

1238. Kjellker Gimre, Monica. 1990. Re: Complete soymilk or soybase plants installed by Alfa-Laval worldwide from 1979–1989. Letters to William Shurtleff at Soyfoods Center, May 30 and Aug. 24–in reply to inquiry. 1 p. Typed, with signature on letterhead.

• ***Summary:*** The following plants are listed chronologically by year of start-up, and within each year, alphabetically by country. Start-up–Country–Company–Product–Capacity (liters/hour)

1979–Malaysia–Lam Soon–soymilk–5,000
1980–Thailand–Kickapoo–soymilk–4,000

All plants made from 1984 on use Alfa-Laval's new Soyal design.

1985–West Germany–Ice cream maker [Schoeller]–soybase–3,000
1985–Switzerland–Soyana–soybase–1,000
1986–China–Guangzhou Cannery [Guangdong]–soymilk–2,500, 2 dec.*
1986–France–Cacoja–soybase–1,500
1987–China–Jin Jiang Foodstuffs Factory–soymilk–2,500
1987–India- Noble Soya–soymilk–4,000, 2 dec.*
1988–Argentina–Alimentos de soja–soymilk–4,500
1988–China–Jiangmen Foodstuff Factory–soymilk–2,500, 2 dec.*
1988–China–Wuhan Guan Sheng Yuan Foodstuff Factory–soymilk–2,500, 2 dec.*
1988–France–Innoval–soybase–1,500
1988–Nepal–Indreni–soymilk–2,500
1988–Nigeria–Sona Dairies–soymilk–4,500
1989–Australia–Sanitarium Foods–soybase–500
1990–France–Dairy Co-op**–soybase–500

* = 2 decanter centrifuges per system to boost the protein yield. The systems made before 1984 were for more traditional soymilk. Those made afterwards no longer require that the soybeans be soaked, and the "new" soyabase line in designed primarily for producing a non-beany soymilk, but it can be easily adjusted to give a traditional soymilk. "Soybase" is the product that comes out of the Soyal soyabase line after grinding, separation in one or more decanters, and deactivation of enzymes like trypsin inhibitors. This base is more concentrated than soymilk (9-12% solids/dry matter) and is what is used as the raw material for any soy-based product. "Soymilk" is a blended drink, often containing sugar, and standardized to a protein

level required by the market. Soybase would only be run through an ultrafiltration unit to (1) remove phytic acid and oligosaccharides, or (2) to remove moisture and increase the percentage solids, as to make tofu. ** The plant owned by the Dairy Co-op in France is secret, but the base it produces will be used mostly for research on calf milk replacers and on replacing cow's milk in certain dairy products. This dairy does not have any products on the market. Address: R&D manager, Alfa-Laval East Asia Pte. Ltd., 11 Joo Koon Circle, Singapore 2262. Phone: 86 22 711.

1239. Urban, Svadesha Ruediger. 1990. The history of Toforei Svadesha, West Germany's first tofu manufacturer (Interview). *SoyaScan Notes.* June 13. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ruediger Urban was born in about 1940. After 3-4 years of studying photography, in about 1969, he began working in a restaurant named Hotel Brauneberg that had been started by his brother in the city of Traben-Trarbrach on Mosel (Moselle) River. At the restaurant he came across a large, high quality cookbook (covered in white silk) by Werner Fischer [or perhaps Alfred Walterspiel] titled *Meine Kuenst in Kueche und Restaurant* (My Art, Kitchen, and Restaurant) that contained 2-3 pages of information in German about how to make tofu. He started to buy the ingredients, but he was so overworked that he had no time to really start experimenting with tofu.

Then he went to work in a "Macro-Shop" in Deggendorf, in the Bavarian Forest, but he did not do anything with tofu there. Meanwhile he sold arts and crafts at marketplaces for several years to support himself and his two sons.

Then, in about 1979, he started on the side to make tofu in a little farmhouse at Winterlehen 1½, Einweging, in the Bavarian Forest (Bayerischer Wald). He ordered a copy of *The Farm Vegetarian Cookbook*, from which he learned more about tofu. He made only one product, tofu, using organically grown soybeans and nigari coagulant. Initially he tried making the tofu without removing the okara, but he soon filtered the milk to removed the okara. He made the tofu using a gas stove, which he sometimes used in the kitchen and sometimes moved out into the garden. The tofu was sold under his name Svadesha (he was a disciple of Bhagavan Sri Rajneesh) but he had no officially registered business. On weekends his two sons, Premdeva (the elder) and Gyandeva, helped with the tofu business. Twice a week he produced about 30-40 kg of tofu, which he packed in small plastic tubs, loaded into his car? and drove more than 200 km (120 miles) into Munich. There he personally delivered it to a handful of the new generation of natural food stores *(Biolaeden)* that sold all of his tofu. These pioneer natural foods shops included Erdgarten (the first), and Macro-Shop on Amalienstrasse. While still in Einweging he introduced his second product, Kraeuter Tofu (Herb Tofu), made by mixing and mashing herbs into finished pressed tofu to make a sort of seasoned tofu cottage cheese.

After about a year making tofu at this location, he decided to go to India for 6 months, so he entrusted his small business to another person while he was gone. The company fell apart during this time. Upon his return from India, Svadesha moved the business to Aeussere Koetzingerstr. 52a, D-8492 Fuerth im Wald, very near the Czechoslovakian border, and farther away (about 200 km or 120 miles) from Munich. He knew a woman friend there where he could work and stay. This new tofu shop began operation on 1 March 1981 and, because of pressure from retailers who needed official invoices, he registered the company under the name Svadesha Pflanzen-Feinkost. By mid-1982 was using 20 lb of soybeans each time to make tofu 3 times a week. In Furth im Wald he introduced a new product, Tofu Pflanzarl, a special kind of Bavarian meatless meatballs or "Bolleten." Soon he was getting more and more orders.

So in 1983 Svadesha moved his company into Munich, his main market, and set up shop in Das Werkhaus at Leonrodstr. 19. Alexander Nabben's tofu shop was in the same building, but Alexander kindly offered to stop making tofu at that time. Svadesha changed his company's name to Tofurei Svadesha Naturkost Produkte. During this period, at meetings of Germany's various German tofu makers, the question arose as to which company had started first. It was clearly decided and agreed that Svadesha had been the first. Other early companies were Alexander's Tofu Shop (an underground business founded by Alexander Nabben at the Werkhaus on Leonrodstr. in Munich; started tofu production by Jan. 1981), and Auenland Tofu und Soja Produkte (founded by Peter Wiegand at Prien-Chiemsee; started tofu production in March 1982). Svadesha thinks (but is not sure) that Biogarten sold tofu made by other companies (including Svadesha's) but never made their own. Note that all of West Germany's early tofu companies started in southeastern Germany in the area around Munich.

In Munich, Svadesha kept making improved versions of his regular tofu, herb tofu, and tofu meatless meatballs. He also launched a new Tofu Pastete (Tofu Spread), and Raeucher Tofu (Smoked Tofu, in 3 flavors).

In 1985 Svadesha moved again, this time to a suburb east of Munich near Denning, into a former butcher shop (at Ospreussenstr. 22, D-8000 Munich 81), the company's present location. There the company really started to earn money. They introduced a new type of Tofu Pflanzarl, new Tofu Pastete (one with herbs, and one with tempeh), Tofu Burgers, Spice Tofu, Tofu Spring Rolls, and Tofu Schnitten (Tofu Slices) marinated in shoyu then fried, and Sauerkraut Schnitten (Tofu slices filled with sauerkraut). He also started selling tempeh, which was made by Byodo Naturkost.

On 1 June 1990 Svadesha sold his company for a good price to Robert Mayer and Erhardt Schwartz. He had learned 1 year before that he had cancer of the cheeks. At that time the company acquired a new structure and the name became Tofurei Svadesha Naturkost Produkte GmbH. The new owners agree with Svadesha's philosophy and have solid business experience, so the future looks promising. The company's best selling products are now, in descending order of popularity: Plain Tofu, Tofu Pflanzarl, Smoked Tofu, Tofu Schnitten (marinated, deep-fried slices), and Tofu Spring Rolls.

Aside from being the first tofu company in Germany, Svadesha feels that his other major innovations were being the first to make smoked tofu, Tofu Pflanzarl (tofu meatless meat balls), Herb Tofu, Tofu Schnitten, and Sauerkraut Schnitten. Address: Home: Waldstr. 4, D-8015 Ottenhofen, West Germany.

1240. Menzies, John. 1990. Re: Harry Miller's work with soymilk in East Asia. Plans by the South China Island Union Mission of Seventh-day Adventists to set up a health food company in Hong Kong and Taiwan. Letter to William Shurtleff at Soyfoods Center, June 20. 2 p. Typed, with signature on letterhead.

• ***Summary:*** After his soyfoods plant in China was destroyed, Dr. "Harry Miller retreated to Taiwan along with the Nationalists and later set up a soya milk plant associated with the Taiwan Adventist Hospital which has long since gone. I am not even sure when the soya milk operation was discontinued. Unfortunately the only industries set up in Hong Kong were hospitals.

"Recently I was asked by the South China Island Union Mission of SDA's to set up a health food industry in Hong Kong and Taiwan... My background is food technology and I have worked for Sanitarium in Australia and New Zealand for a number of years.

"Initially we will import various products from our sister institutions around the world and where possible re-pack under our own label. This will allow us to get a feel for the market so in the near future we will know what sort of a manufacturing plant to set-up (i.e. soyamilk, vegetarian, or cereal). It looks like we might even have an opportunity to set up a manufacturing base in one of the specially administered regions in communist China." Address: General Manager, Food Div., South China Island Union Mission of Seventh-day Adventists, 40 Stubbs Rd., 2nd floor, Hong Kong. Phone: 838-3991.

1241. Gaiser, Klaus. 1990. The second German Soyfoods Association meeting, and new developments (Interview). *SoyaScan Notes.* June 29. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Shurtleff wrote a letter to the German Soyfoods Association. Gaiser translated it into German and read it to those assembled at the second meeting. But the letter did not impress them very much; the smaller tofu manufacturers are still afraid of the bigger ones. They are all struggling with their daily problems of cash flow, etc. and do not seem very interested in long-term planning. Now Klaus and Thomas Karas are interested in working to reactivate the European Soyfoods Assoc. and/or found a new association in Germany. Klaus is not so busy now during the summer, when people in Germany eat less tofu than during the cold months.

Concerning Auenland, Klaus feels that this company was a very unfair competitor in terms of spreading misinformation about Klaus. In Germany there is a law that magnesium salts cannot generally be used as an "ingredient" in foods (incl. magnesium chloride in tofu), unless it is considered as a "processing aid" *(Hilfstoff)* if very little ends up in the final product. This last area is a gray area. Yamato has always taken the safer path and used calcium sulfate as a coagulant. But tofu was introduced to Germany mainly by followers of macrobiotics, who favor use of nigari (unrefined magnesium chloride). So Peter Wiegand repeatedly went to Yamato's most important wholesaler and complained: "Can you imagine it. Yamato is using 'Plaster of Paris' in their tofu. Its just like making concrete out of soybeans. For God's sake. How can you sell such a product to your retailers?" Yet Wiegand knew that this was a good, natural coagulant that had been used in China (where it is named *shu-gao)* since ancient times to make tofu.

Concerning Avo Feinkost and their Sofit line of second generation tofu products–it is a complex situation. Klaus is not sure whether or not Avo makes any tofu, since the company does not sell any tofu as such. Klaus is not sure but he thinks that Avo does not buy tofu, but rather makes tofu out of soy protein isolates. The products are quite good imitations of sausage products. The man who runs the tofu operation is a butcher by trade. The biggest German Reform House foods distributor is Heirler, which like Yamato, is partly owned by Huegli. Heirler sells basic tofu that is mainly from Hensel, and second generation tofu products which (as far as Klaus knows, up until now) exclusively from Avo but under the Heirler brand. Heirler does not yet sell any Yamato products, but in the long run Heirler will since Yamato is a sister firm. Things seem to be moving very slowly, however.

Concerning Wolfgang Haberger, Thomas started the company officially in 1982 and Wolfgang joined in Jan. 1984 because he had capital to found the GmbH (Company Ltd.). He left officially in June 1989, but in fact he left earlier. Klaus and Wolfgang did not fit and work together well. Address: President, Yamato Tofuhaus GmbH, Rittweg 11/1, D-7400 Tuebingen–Hirschau, West Germany. Phone: 7071-71094 or 95.

1242. Sand, Ralph. 1990. Early work with tofu and imitation cheeses at Anderson Clayton Foods in Texas (Interview). *SoyaScan Notes.* June 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In 1972 Ralph started to work as a researcher for Anderson Clayton Foods at the William Clayton Research Center in Richardson, Texas (just northwest of Dallas). Shortly thereafter he hired an assistant, Dick Johnson (who now lives in Cross Lake, Minnesota). Ralph worked on imitation cheeses for about 12 years. In 1973 Anderson Clayton introduced a casein-based Mozzarella-flavored imitation cheese under the Unique Loaf brand. It was made at the company plant in Humboldt, Tennessee, which made only imitation cheeses. Some of these products are still on the market. These were the first successful imitation cheeses in the USA.

The goal of Ralph's research was to develop imitation American (process) and mozzarella cheeses (with some interest in imitation a cultured cheese such as Cheddar) that used soy protein isolates instead of casein. There were various problems: 1. Casein tends to develop a barn-like odor when it stands around a while. 2. Getting a true cheese flavor from a flavor house, or by hydrolysis of natural cheeses to a get a very strong cheese flavor. 3. Casein contains a little cholesterol bound to it, so a casein-based cheese cannot be advertised as cholesterol free. 4. Casein has to be imported. The best quality comes mainly from Ireland, Australia, or New Zealand, where more milk is produced than consumed. Casein from the USA would be too expensive. Soy protein is widely made domestically.

Their research showed that the casein (protein) in dairy cheese does not actually melt; the fat melts but the protein dissolves in the water contained in the cheese. The main problem with soy-based casein-free cheeses was that they could not be made to melt. There was some success in making a cheese that combined soy protein with casein; this product was marketed. They found that a mixture of polyphosphates (especially tripolyphosphates) was very helpful in making soy proteins dissolve in cheeses. Soy protein is extremely difficult to work with in cheeses, especially because it lacks the solubility characteristics of casein. Enzymes (rennin and *Mucor miehei* [a bacterial enzyme that works line rennin]) were applied to the soy proteins with some success.

Marvin Thompson and Dorothy Brower at the Eastern Regional Research Lab. in Philadelphia, Pennsylvania, did considerable work trying to substitute soy protein for casein in cheeses, then fermenting it. They had a modicum of success.

In about 1975-76 Anderson Clayton got interested in producing tofu as a consumer retail product, either in the USA, Mexico, or Brazil. They already sold margarine and salad dressings. This tofu work was independent of the cheese research. Ralph's group of 3-4 researchers made an engineering study of tofu, studying the protein and oil recoveries, doing nutritional and cost analyses, etc. The director of research at the time was Mr. Harold Keesee (who now lives in the Dallas area). The person who keeps in touch with all former Anderson Clayton employees is Jess Covey (phone: 214-423-5517). On 6 Jan. 1977 Ralph attended a lecture on tofu given by William Shurtleff in Dallas, Texas. Afterwards they discussed the subject. After about a year of research, the tofu project fizzled out; the company probably figured there was not enough money to be made in tofu.

One of the company's junior directors, A.H. Tony Chen (who now lives at 4113 Midnight Dr., Plano, TX 75093), was pushing soy protein in tofu or a product like tofu for sale in China. He formed a company, hired a number of ex-Anderson Clayton employees, and they were making the product in Texas. He was having great success until some economic problem in China put a damper on his work.

Ralph was taken away from research on imitation cheeses in about 1984 to do other research. He was replaced by a person named Pete. Dick Johnson continued in the cheese work until about 1987. In about 1984 an imitation cheese containing some soy protein was introduced commercially. Note: Dick Johnson recalls that Tony Chen exported lots of food manufacturing equipment (made by other U.S. companies) to China but he was not aware that Tony did any work with foods. He is now a consultant in Plano, Texas. Address: 182 Moonlight Dr., Plano, TX 75094. Phone: 214-423-0050.

1243. Hymowitz, T.; Singh, R.J.; Larkin, R.P. 1990. Long distance dispersal: The case for the allopolyploid *Glycine tabacina* (Labill.) Benth. and *G. tomentella* Hayata in the West-Central Pacific. *Micronesica (Guam)* 23(1):5-13. June. [39 ref]

• ***Summary:*** The subgenus *Glycine* currently contains 15 inbreeding wild perennial relatives of the soybean. These are *Glycine albicans, G. arenaria, G. argyrea, G. canescens, G. clandestina, G. curvata, G. cyrtoloba, G. falcata, G. hirticaulis, G. lactovirens, G. latifolia, G. latrobeana, G. microphylla, G. tabacina,* and *G. tomentella.*

Fourteen of these are diploids (2n = 40) and endemic to the Australian region. However the allopolyploid types (2n = 80) of *G. tabacina* and *G. tomentella* have a wider distribution. *G. tabacina* contains both diploid and tetraploid (2n = 80) members. The diploid forms of *G. tabacina* are found only in Australia, however the tetraploid members of *G. tabacina* have a wider distribution. They are found in the Pescadores Archipelago (Taiwan), the islands of Quemoy and Amoy just off the cost of Fujian Province (China), Ryukyu Islands (Japan), and the Mariana Islands of Tinian and Saipan in the West-Central Pacific. The tetraploid forms of *G. tabacina* are also found in Australia and the South

Pacific Islands of New Caledonia, Vanuatu, Fiji, Tonga, and Niue.

G. tomentella is composed of four cytotypes: 2n = 38, 40, 78 and 80. Only the 38-chromosome form is found in Australia. The 40- and 78-chromosomes are found both in Australia and in nearby Papua New Guinea. The tetraploid forms of *G. tomentella* occur in Australia, Papua New Guinea, the Philippines, and Taiwan.

No diploid perennial *Glycine* species have been found outside of Australia. This the questions arises concerning the origin of the allopolyploid forms of both *G. tabacina* and *G. tomentella* in the West-Central Pacific. The seed of wild perennial *Glycine* do not float on water nor do they possess any mechanism for long distance dispersal by air currents. They do not stick to the coats of animals and it is unlikely they were transported by humans because the literature makes no mention of uses of wild perennial *Glycine* species by humans.

"Plate tectonics and biogeography: After the breakup of Pangaea, the universal land mass, Australia, New Zealand and Antarctica were united with South America and with India-Madagascar-Africa, forming Gondawanaland (100 m.y. BP [100 million years before the present]), a Southern Hemisphere land mass. The West-Central Pacific is associated with Laurasia, a Northern Hemisphere land mass.

"New Zealand and New Caledonia separated from Australia and Antarctica about 80 m.y. BP and moved north-eastward reaching their present position about 60 m.y. BP. Australia and Antarctica separated about 49 m.y. BP. As Australia moved northward it entered a zone of reduced precipitation and increased aridity. The Australian plate collided with the Asian plate 10 to 12 m.y. BP. Most probably during this epoch, Miocene, some legumes entered Australia directly from Asia. At that time, Australia was widely separated from South America, India, Madagascar and Africa...

"According to Lackey (1977, p. 85) both 'the subgenus *Glycine* and the subgenus *Soja* are probably derived from *Pueraria*-like ancestors in tropical Asia. From this tropical center, species in the subgenus *Glycine* have successfully invaded Australia and associated areas, and the wild form in the subgenus *Soja* has invaded central and northern Asia.' *Glycine* species (2n = 40) are diploidized polyploids with x = 10."

It has been demonstrated that the allopolyploidization of *Glycine* species (2n = 80) took place only in Australia. "Thus, perennial *Glycine* found a niche in tropical and subtropical Australia. Radiation of *Glycine* species, followed by allopolyploidization of the species, resulted in the *G. tabacina* and *G. tomentella species complexes.*"

Long-distance dispersal of *Glycine* seeds from Australia across the equator was probably performed by migratory birds–with shorebirds being the most promising candidates. It has been shown that seeds such as *Glycine* larger than 1 mm and having a hard seedcoat can be retained in the digestive tract of some shorebirds for more than 100 hours then excreted in viable form. With flight speeds of 30-60 miles per hour, the seeds could be transported 3,000 to 6,000 miles per flight. The birds may also pick up small, light seeds in mud adhering to their feet.

For comments on this paper see the March 1995 interview with Prof. Hymowitz titled "Plate tectonics and the dissemination of the soybean." Address: 1-2. Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801; 3. State of Illinois Natural History Survey, Section of Wildlife Research, Urbana, IL 61801.

1244. **Product Name:** Tofu Spicy, Tofu Teriyaki.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1990. June.
Ingredients: Spicy: Organic soybeans, water, soy sauce, sunflower oil, spices, herbs, natural nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 200 gm.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in June 1990. Spicy: Yellow, red, black and white on green. On the front are four small Chinese characters.

1245. **Product Name:** Marinated Tofu, Herb Tofu, and Smoked Tofu.
Manufacturer's Name: Pureland Soy Products.
Manufacturer's Address: 23 Depot St., Maroochydore, QLD 4558, Australia. Phone: 071-43-4254.
Date of Introduction: 1990. June.
New Product–Documentation: Letter and leaflet sent by Jennie Finnigan and Ricciardo Ferrari. 1992. June 17. In June 1992 the company moved to a new address with a new phone number: Lot 47 Page Street, Kunda Park, QLD 4556. Phone: (074) 45 6077. The letter states that the company also makes Herb Tofu, Smoked Tofu, Hummus, and a Vegetarian Paté.

Talk with Jennie Finnigan. 1992. June 28. Another man started this business 3-4 years ago, doing a marinated tofu, a smoked tofu, and an herb tofu. She and Ricciardo made and sold him the tofu for these three products. Then he decided to give up that business so she and Ricciardo took it over.

1246. Sullivan, Nardia. 1990. Don't lose your tempeh–eat it! *Midland Express (Victoria, Australia).* Aug. 28. p. 7, 40. • ***Summary:*** Tells the story of Mike Manser (who is shown holding up 2 packages of his tempeh in a large photo) and his tempeh company named Nectar Soy products in Daylesford, Victoria, Australia. "The Daylesford resident was the first in Australia to manufacture tempeh." The company distributes its Nectar tempeh from Melbourne to Darwin.

"An engineer by profession, Mike first became interested in tempeh after he gave up his job in Ford's engine development laboratory in Geelong. 'At around the same time I stopped working as an engineer, I became a vegetarian,' Mike said. 'I soon discovered there was nothing on the market equal to meat for the vegetarian...'

"There are now four outlets manufacturing tempeh in Australia. 'There is one company in Sydney operating on a larger scale,' he said. 'But I get by on quality and flavor.'" Address: Australia.

1247. Hymowitz, Ted. 1990. Re: The Taiping Rebellion and Chinese refugees to the Western World. Letter to William Shurtleff at Soyfoods Center, Sept. 5. 2 p. Typed, with signature on letterhead.

• ***Summary:*** "The Taiping Rebellion (1851-1864) created 1.5 million Chinese refugees. Some emigrated to the U.S. to work on the railroads, others went to Australia and New Zealand to tend sheep. A large number were sold into slavery and found themselves working primarily on sugar cane plantations in Peru, Panama, and Cuba. In Peru alone between 1849 and 1874 over 100,000 indentured Chinese slaves toiled in the fields. It seemed reasonable to me that the soybean should have followed the Chinese to Peru."

Hymowitz talked with Dr. Michael J. Gonzales, author of *Plantation Agriculture and Social Control in Northern Peru, 1875-1933* (Univ. of Texas, Austin, 1985). When asked by Hymowitz what the Chinese in Peru ate, he replied, "I suppose they ate rice, fish, and common beans."

On page 99 of the book is the following sentence, "The Chinese, however, eschewed beef in favor of pork, and were able to cultivate, in the Chicama Valley at least, Chinese vegetables." Note 19 on page 210 refers the reader to "On vegetables, see Middendorf, Observaciones y estudios, p. 1:262." Note 17 on the same page provides the complete reference to the book by Ernst W. Middendorf titled *El Peru: observaciones y estudios del pais y sus habitantes durante una permanencia de 25 años, 2 vols., trans. Ernesto More* (Lima: Universidad Mayor de San Marcos 1973).

Since these references either are incorrect or do not mistake, Hymowitz has (at least for the time being) given up on his pursuit of the soybean in Peru. The purpose of this work was to push back the earliest known date for the introduction of the soybean into Latin America. Address: Prof. of Plant Genetics, Urbana, Illinois. Phone: 217-333-9454.

1248. Hamilton, Ross; Manser, Mike. 1990. Re: History of Nectar Soy Products in Australia. Letter (fax) to William Shurtleff at Soyfoods Center, Sept. 13. 2 p.

• ***Summary:*** Nectar Soy Products is located at 57 Vincent Street, Daylesford, Victoria 3460, Australia. Phone: 053-48-2051. The present owner and founder, Mike Manser, provided this information. The company was founded in March 1981 to provide a full meat equivalent vegetarian food source. The company began commercial production of soyfoods in June 1981 at 4/13 Glamis St. (P.O. Box 969), Geelong, VIC, 3220, Australia. The company's first two products were Tempeh-"Nectar (March 1981) and Garlic Tempeh (March 1985). In May 1985 the company moved from Geelong to its present address in Daylesford. Main reasons for the move were to get pure water (no chlorine or fluoride) and a cleaner environment, to reduce overhead on product transportation, and to have room for a walk-in cooler. It then introduced Curry Tempeh Pies (June 1986) and Lupin Tempeh (Sept. 1990). Manser has always been the sole owner, and is one of the two production workers. Manser believes "I was the first in Australia to manufacture and market tempeh." According to Soyfoods Center records, this is the oldest existing tempeh manufacturer in Australia, but it was the third commercial tempeh company in Australia, after Dharma (c/o Earth Foods, Waverley, NSW; started 1980) and Bodhi Farm Tempeh Co. (Channon, NSW; 1980). It was the first Australian company to produce lupin tempeh commercially and to assist the Food Research Lab at Melbourne University (Weribee, Victoria). The owner feels that the main reason for the company's success is high product quality and painstaking customer contact. Indonesian-Australians confirm this.

Today the company makes about 1,500 lb/week of tempeh. The three best-selling products, in descending order of sales, are soy tempeh, curry tempeh pies, and garlic tempeh. The company employs 2 people in a 1,500 square foot building. The company growth rate has been about 30% a year over the past 2-3 years. Last year's sales were $160,000. The net worth of the business is not known. Address: R.W. Hamilton & Associates Pty. Ltd., Marketing Consultants, 36 Castlemain Rd., Maldon, VIC, 3463, Australia. Phone: 054 75 2884.

1249. Doyle, Jeff J.; Doyle, Jane L.; Brown, A.H.D. 1990. Chloroplast DNA phylogenetic affinities of newly described species in *Glycine* (Leguminosae: Phaseolae). *Systematic Botany* 15(3):466-71. July/Sept. [16 ref]

• ***Summary:*** This is the earliest document seen (one of two studies) that uses molecular studies to establish genomic relationships among the wild perennial *Glycine* species. The researchers used restriction site variation in chloroplast (cp) DNA to infer phylogenetic relationships among the *Glycine* species. Address: 1-2. L.H. Bailey Hortorium, Cornell Univ., Ithaca, New York, 14850 3. CSIRO Div. of Plant Industry, Canberra, ACT 2601, Australia.

1250. **Product Name:** Lupin Tempeh.

Manufacturer's Name: Nectar Soy Products.
Manufacturer's Address: 57 Vincent St., Daylesford, VIC, 3460, Australia. Phone: 053-48-2051.
Date of Introduction: 1990. September.
New Product–Documentation: Letter (fax) from Ross Hamilton and Mike Manser. 1990. Sept. 13. This was the company's fourth product, introduced in Sept. 1990.

1251. Wilcox, Gilsea; Wahlqvist, M.L.; Burger, H.G.; Medley, G. 1990. Oestrogenic effects of plant foods in menopausal women. *British Medical Journal* 301(6757):905-06. Oct. 20. [5 ref]
• ***Summary:*** 25 postmenopausal women in good health and taking no drugs, ages 51-70, were studied for 6 weeks during which time their diet was supplemented with soya flour (45 gm daily), red clover sprouts (10 gm dry seed daily), and linseed (25 gm daily). These three foods are reported to induce vaginal oestrus in laboratory animals. The authors found significant differences in vaginal cytology: vaginal cell maturation increased and concentrations of follicle stimulating hormone and luteinising hormone were raised compared to a control group. Phyto-estrogens thus appear to be of consequence in human nutrition. Tamoxifen, an antioestrogen, can have oestrogenic effects on vaginal cytology.

Wahlqvist raises the following questions in an unpublished letter to a colleague: Would a diet containing more plant estrogens lead to an easier menopause in women? There is some evidence that women in the Third World, Japan and China may experience less of a menopause. His wife is Chinese. Chinese women living in Australia seem to experience less of a menopause, and he now has a study going, comparing 600 of them with Caucasian counterparts. It might turn out that western menopause is abnormal, perhaps because the diet is high in fats and low in plant foods/phytoestrogens. Phytoestrogens might affect osteoporosis and bone density, especially after menopause. Adlercreutz in Finland is doing important work in these areas. Note: This is the earliest document seen (Sept. 1999) in which soy isoflavones are mentioned in connection with relief of menopausal symptoms. Address: 1. Medical student; 2. Prof. of Medicine. Both: Monash Univ., Dep. of Medicine, Prince Henry's Hospital Campus, Melbourne 3004, Victoria, Australia; 3. Director, Prince Henry's Inst. of Medical Research, Melbourne.

1252. Bennett, Fiona C.; Ingram, David M. 1990. Diet and female sex hormone concentrations: an intervention study for the type of fat consumed. *American J. of Clinical Nutrition* 52(5):808-12. Nov. [21 ref]
• ***Summary:*** International studies show that the consumption of animal fats but not vegetable fats correlates well with breast cancer mortality. Moreover, the association between animal-fat consumption and breast cancer appears to depend on the type of fat consumed. For example, Eskimos, who have a high fat consumption that is mainly of seafood origin, have a lower incidence than do other corresponding populations. Moreover, many animal studies show that the type of fat consumed is an important determinant of breast cancer.

This study shows how the type of fat consumed affects female sex hormone concentrations. When healthy premenopausal women changed to a vegetarian diet, the total amount of their estradiol hormone was significantly reduced. Prolactin was directly associated with fat consumption, whereas sex-hormone-binding globulin was inversely associated with fat consumption (particularly cholesterol consumption). Address: 2. Senior Lecturer in Surgery. Both: University Dep. of Surgery, Queen Elizabeth Medical Centre, Perth, Western Australia.

1253. **Product Name:** [Bonsoy (Soymilk)].
Manufacturer's Name: Mimasa (Importer). Made in Japan by Marusan. Imported via Muso Shokuhin.
Manufacturer's Address: Mimasa, Spain.
Date of Introduction: 1990.
Ingredients: Water, soybeans, pearl barley, kombu (sea vegetable), barley malt.
New Product–Documentation: Talk with Yuko Okada. 1992. July 16. Muso first exported Bonsoy soymilk to Mimasa in Spain in about 1990.

1254. **Product Name:** Sanitarium So Good Lite: The Low Fat Soy Drink.
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia.
Date of Introduction: 1990.
Ingredients: Water (88.0%), soya isolate (4.0%), maltodextrin (3.3%), corn syrup solids (3.1%).
Wt/Vol., Packaging, Price: 1 liter Combibloc Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter and Label sent by Sanitarium Health Food Co. 1990. June 25. Gives product introduction date as 1990.

Sanitarium Nutrition Education Service. 1990. April. "So Good." This 4-page leaflet gives a clear explanation of each ingredient used, plus nutritional and other information.

1255. Bounds, Sarah. 1990. Thorsons green cookbook: Food for a healthy future for you and the planet. Hammersmith, London, England: Thorsons–An imprint of HarperCollins Publishers. 159 p. Index. 22 cm. [6 ref]
• ***Summary:*** The cover states that this book shows you how to: "Plan and equip a green kitchen. Find organic foods free from chemicals. Protect your body against pollution. Eat food that tastes good and does you good." But the diet-

environment connection is made only superficially and ineffectively. And this book takes an ambivalent stand on a vegetarian diet. While showing the many environmental benefits of a vegetarian diet, it suggests softly that readers may want to restrict consumption of red meat, but stops far short of encouraging them to stop eating it (see p. 22, 24). Moreover, meat, poultry, and fish are used in many recipes, especially in the chapter titled "Make Meat Go Further" (p. 111-122).

The ecological benefits of soyfoods are praised (p. 23), but soy is apparently used in only one recipe (Tofu Chow Mein, p. 75) in the chapter titled "Speedy Oriental Masterpieces.

Pages 141-52 give a useful list of organic farm shops in the UK; all are Soil Association Symbol holders. Page 153 lists 11 useful addresses in the UK and Australia. Address: England.

1256. Isern, Thomas D. 1990. Bull threshers and bindlestiffs: Harvesting and threshing on the North American plains. Lawrence, Kansas: University Press of Kansas. xiii + 248 p. Illust. 24 cm. *

• ***Summary:*** The word "bindle" is derived from "bundle." In the argot of tramps and hoboes, a bindle stiff (the term was first used about 1901) is a hobo, especially one who habitually carries his clothes and/or bedding in a bundle. In Australian slang, such a hobo might be called a "swagman." Address: North Dakota State, Dep. of History.

1257. Newman, Marcea. 1990. Naturally sweet desserts: The sugar-free dessert cookbook. Garden City Park, New York: Avery Publishing Group. 264 p. 26 cm. *

• ***Summary:*** This is a revised edition of Marcea's 1974 classic book *The Sweet Life*. She revised it extensively to suit Australian tastes, including chapters on cooling desserts and drinks. Address: Australia.

1258. **Product Name:** Tofu.
Manufacturer's Name: Orient Food Corporation.
Manufacturer's Address: P.O. Box 6355, Temuning, Guam 96911. Phone: 671-649-0025 or 646-1509.
Date of Introduction: 1990?
New Product–Documentation: Letter from Linda M. Usita, P.O. Box 23831, GMF, Guam 96921. 1990. Sept. 4. This is the only tofu factory in Guam.

Note 1. Guam is an unincorporated U.S. territory, the largest and southernmost of the Mariana Islands, located about 1,500 miles east of Manila, Philippines. It was ceded to the U.S. by Spain in Dec. 1898 and occupied 1899. The 106,000 residents of Guam have enjoyed full U.S. citizenship since 1950.

Note 2. This is the earliest known commercial soy product made in Guam.

Talk with Stanley Darby of Agat, Guam. 1995. June 14. This company still makes tofu, which is sold under the Hondu brand in water-filled plastic tubs with a little sheet of paper over the top. They were closed recently by health inspectors for sanitation violations.

1259. Sanitarium Health Food Co. 1990? Our story (Brochure). 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia. 4 p. Undated. 30 cm.

• ***Summary:*** Gives a brief history of the company, interspersed with many color photos; one very old photo shows an early food factory, while another shows some of the company's popular products, especially breakfast cereals, soymilk, and meatlike products. The company's export division is at Hudson Ave., Castle Hill, NSW 2154, Australia.

"The fascinating history of the Sanitarium Health Food Company started in the late 19th century when a group of highly motivated immigrants from the United States decided to make their living by distributing health foods that they had imported from Battle Creek, in Michigan, USA. Battle Creek was famous then for its Sanitarium, the health retreat based on a Swiss model, where the rich and famous from all parts of the United States and Europe came for a relaxing health holiday. One of the draw cards of this place was a breakfast cereal and health food manufacturing plant, the purpose of which was to supply food to the institution as well as to the neighbouring districts.

"A selection of these products was sent to Melbourne, Australia, in 1897, but before too long the demand for these unique foods outstripped the availability. Local production was inevitable...

"The name, Sanitarium Health Food Company, was adopted in 1898." Address: Wahroonga, Australia. Phone: (02) 487 1711.

1260. Sanitarium Health Food Co. 1990? Product range. 148 Fox Valley Rd., Wahroonga, N.S.W. 2076, Australia. 6 p. Catalog. Undated. 30 cm.

• ***Summary:*** Product lines include: Flake biscuit range (incl. Weet-Bix ["Australia's favourite whole wheat malted breakfast biscuits"], Corn Flakes, and Muesli). Loose cereal range. Sundry cereal range. Drinks and beverages (incl. So Good soymilk). Spreads (peanut butter and marmite). Legumes, grains, seeds (incl. soya beans in 500 gm bag). Dried fruits. Nuts. Mixes (such as nuts & raisins). Canned vegetarian meals (24 meatlike products, 3 of which are dry TVP in boxes). Misc. foods (incl. natural lecithin and lecithin granules).

The company also has an export division at Hudson Ave., Castle Hill, NSW 2154. Address: Wahroonga, Australia. Phone: (02) 487 1711.

1261. **Product Name:** Sanitarium Health Foods Soya Beans (Dry in Poly Bag).
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 146 Fox Valley Rd., Wahroonga, NSW 2076, Australia.
Date of Introduction: 1990?
Ingredients: Soybeans.
Wt/Vol., Packaging, Price: 500 gm poly bag.
How Stored: Shelf stable.
New Product–Documentation: Sanitarium catalog. 1990. Product range.

1262. **Product Name:** Sanitarium Health Foods Lecithin [Natural in Can, or Granules in Poly Bag].
Manufacturer's Name: Sanitarium Health Food Co.
Manufacturer's Address: 146 Fox Valley Rd., Wahroonga, NSW 2076, Australia.
Date of Introduction: 1990?
Wt/Vol., Packaging, Price: 125 gm can or 250 gm poly bag.
How Stored: Shelf stable.
New Product–Documentation: Sanitarium catalog. 1990. Product range.

1263. Sanitarium Nutrition Education Service. 1990? A food lover's guide to vegetarianism. Sanitarium Health Food Co., P.O. Box 249, Wahroonga, NSW, 2076, Australia. 12 p. Undated. 30 cm.
• ***Summary:*** Contents: A taste for healthy eating. Health advantages. A vegetarian diet is nutritionally adequate. How can I change my eating habits? Suggested vegetarian menu. Address: Wahroonga, Australia. Phone: (02) 487 1711.

1264. **Product Name:** Tofu [Hard Organic].
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484, Australia. Phone: (066) 72 5931.
Date of Introduction: 1991. January.
Wt/Vol., Packaging, Price: 375 gm, 500 gm, and 750 gm. Vacuum packed in plastic bags.
How Stored: Refrigerated.
New Product–Documentation: Letter from Greg Nance-Kivell, consultant. 1993. Aug. 12. The company letterhead and business card now reads: "EarthStar–Manufacturers of Quality Wholefoods. P.O. Box 654,..." They have ordered 2 copies of *Tofu & Soymilk Production, and note:* "We are a non-profit organisation with the aim of giving work opportunities to people with disabilities. We produce organic products based on soybeans, chickpeas, wheat, etc. We produce under three brands and products include tofu, soymilk, hommus [hummus], felafel, vegi sausages, and we will market soy yoghurt desserts in the future. We took over Chinese Farmhouse some 3 years ago."

Letter (fax) from Greg Nance-Kivell. 1996. March 28. Which see. "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse."

1265. Norumu, Wayne W.; Baqar, M.R.; Board, P. 1991. Acceptability of soymilk to young Papua New Guineans. *ASEAN Food Journal (Malaysia)* 6(1):24-27. Jan. [14 ref]
• ***Summary:*** Plain and flavored soymilks were made from soybeans grown in Papua New Guinea and from a commercial soy protein isolate (Ardex F, made by ADM). Soymilk favored with cacao was accepted by these youth. These products are a good source of energy and protein. Their nutritive value is given. Address: Dep. of Chemical Technology, Papua New Guinea Univ. of Technology, Lae, PNG.

1266. **Product Name:** Tofu Burgers, Sesame Tomato Soya Burgers.
Manufacturer's Name: Pureland Soy Products.
Manufacturer's Address: 23 Depot St., Maroochydore, QLD 4558, Australia. Phone: 071-43-4254.
Date of Introduction: 1991. January.
New Product–Documentation: Letter and leaflet sent by Jennie Finnigan and Ricciardo Ferrari. 1992. June 17. In June 1992 the company moved to a new address with a new phone number: Lot 47 Page Street, Kunda Park, QLD 4556. Phone: (074) 45 6077. The leaflet (brown on yellow) states that, in addition to tofu, the company also makes Tofu Burgers, Curried Lentil Burgers, and Sesame Tomato Soya Burgers.

1267. **Product Name:** Super Soy Tofu.
Manufacturer's Name: Soyfoods Pty. Ltd.
Manufacturer's Address: 14/2 Paton Place, Manly Vale, NSW 2093, Australia. Phone: (02) 949 7314.
Date of Introduction: 1991. January.
Ingredients: Organic soybeans, nigari (a natural seawater extract), water.
Wt/Vol., Packaging, Price: 500 gm, in printed plastic bag.
How Stored: Refrigerated.
New Product–Documentation: Label sent by Jennifer Young. 1991. March. She bought this business on 1-7-1990 (probably 1 July 1990). The company is Great Australian Tofu Pty Ltd., trading as Soyfoods Pty. Ltd.

Note: This company was originally founded in Dec. 1978 as The Soy Bean Factory in Sydney by Michael De Campo, Yoshiko Wright, and Marcea Weber.

1268. Nordquist, Ted. 1991. Changes in structure and ownership at Aros Sojaprodukter in Sweden (Interview). *SoyaScan Notes.* Feb. 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** On 31 Dec. 1990 Ted sold Aros. He now owns one-third of the new corporation named Aros Sojaprodukter AB. Eric Kennhed owns one-third and Blekinge Invest (which owns 100% of Trensums Musteri, a juice company) owns the other one-third. There is a five-person board of directors, and Ted is CEO.

He is trying to find companies to license his new technology and process for making soybase. He has a contract that offers a commission of 3% of the sales of each product for the first year after production starts, plus reimbursement for all travel if it leads to the signing of a licensing contract.

Anders Lindner is now part of Ted's group. William Shurtleff introduced and recommended Ted to him. Anders recently did a soymilk market study for Vitasoy in Australia.

Danish Nutana is in bad shape. Address: CEO, Aros Sojaprodukter, Bergsvagen 1, S-19063 Orsundsbro, Sweden. Phone: 0171-604 56.

1269. **Product Name:** Tofu with Tempeh.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1991. February.
Ingredients: Tofu and tempeh.
New Product–Documentation: Letter (e-mail) from Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling Tofu Tempeh in Feb. 1991. Note: He invented this interesting product.

1270. **Product Name:** Tofu with Vegies.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1991. February.
Ingredients: Organic soybean, water, carrot, onion, parsley, sesame seeds, sea salt, spices, nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 350 gm.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Feb. 1991. Yellow, orange, red and black on green.

1271. Romijn, A; Cuppett, S.L.; Zeece, M.G.; Parkhurst, A.M.; Lee, M.L. 1991. Impact of soy protein isolates and specific fractions on rancidity development in a cooked, refrigerated beef system. *J. of Food Science* 56(1):188-190. Jan/Feb. [24 ref]

• ***Summary:*** Adding 0, 8, 16, or 24% soy protein isolate to cooked, refrigerated beef decreased TBA values proportionally.

Definitions: TBA values refer to values from the 2-thiobarbituric acid test, which measures oxidative rancidity.

WOF stands for "warmed-over flavor. Lipid oxidation can be a significant problem in meat relative to development of off-flavor and off-odor commonly referred to as warmed-over flavor." Address: 1. Agricultural Univ. of Wageningen, Netherlands.

1272. Dawson, Chris. 1991. Re: Chronology of early shipments of shoyu and miso from Mitoku to Europe and the USA. Letter (fax) to William Shurtleff at Soyfoods Center, March 8. 1 p.

• ***Summary:*** 1969–First shipment of organic shoyu (Sakae Shoyu brand) from Fukaya Shoten in Shizuoka prefecture, Japan, to Mr. Sakaguchi of Le Bol en Bois in Paris, in 16 liter tins. This shoyu was made with MOA* ingredients.

1970, Oct.–First shipment of Jôhsen Shoyu and red rice miso from Sendai Miso Shoyu Co. Ltd. in Sendai, Miyagi prefecture.

1971–First shipment of Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture to USA.

1976, March–First shipment of brown rice miso from Sendai Miso Shoyu Co. Ltd. in Sendai, Miyagi prefecture. In 20 kg tins.

1980, May–First shipment of Onozaki rice miso from Onozaki Koji-ten in Tochigi prefecture to Oak Feed in Miami, Florida. 84 cartons and 4 kegs.

1980–First shipment of buckwheat miso from Kamegen Jyozo in Nagano prefecture, to Europe. 100 packs of 500 gm each.

1984, Sept.–First shipment of organic tamari from Mansan Shoten in Aichi prefecture to Blake Rankin of Granum in Seattle, Washington. Four x 18 liters.

1984–First shipment of organic soybean miso from Mansan Shoten in Aichi prefecture to Jon Judson of Soy Source, Christchurch, New Zealand.

1987–First shipment of organic young *(waka)* Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture to USA.

1989–First shipment of organic Hatcho miso from Hatcho Miso Ltd. in Aichi prefecture.

* Note: MOA refers to Mokichi Okada International Association, which is a commercial association related to the Japanese religion *Sekai Kyusei Kyo* which means "helping the world religion." Its basic tenet is to "Make heaven on earth," to bring peace on earth and health to all people. There are approximately 700,000 members in Japan. Mokichi Okada lived 1882-1955. The commercial company was formed in 1920 and is now known as MOA Trading Company. Its purpose is to promote natural and organic farming and provide natural products for people. Address: International Sales Manager, Mitoku Co. Ltd., C.P.O. Box 780, Tokyo 100, Japan. Phone: 3-3201-6701.

1273. **Product Name:** Pureharvest Soy Drink [Natural, or Vanilla].
Manufacturer's Name: Ceres Natural Foods Pty. Ltd. (Importer & Distributor).
Manufacturer's Address: East Bentleigh, Victoria, Australia.
Date of Introduction: 1991. March.
Wt/Vol., Packaging, Price: 1 liter Tetra Brik carton.
How Stored: Shelf stable.
New Product–Documentation: Letter (fax) from Don Lazzaro of Ceres Natural Foods. 1995. June 15. In March 19891 they introduced a 1 liter Lite Soy Milk in Tetra Pak. It is not clear where it was made or in what flavors.

1274. **Product Name:** Vegetarian Sausages.
Manufacturer's Name: Soy Works (The).
Manufacturer's Address: P.O. Box 158 (Huffam Street), Motueka, South Island, New Zealand. Phone: 64-03-528-9170.
Date of Introduction: 1991. March.
Ingredients: Soy pulp (okara), soy protein, soy oil, breadcrumbs, potato starch, gluten, carrageenan (seaweed) gum, caramel, garlic, onions, herbs, spices.
Wt/Vol., Packaging, Price: 400 gm.
New Product–Documentation: Letter and business card sent by Jan Batchelar, owner. 1989. Nov. 8. "I am also looking to develop a vegetarian sausage from the okara."

Letter (fax) and Label sent by Bruce Trevett and Jan Batchelar of The Soy Works. 1991. Aug. 5. "The Soy Works has been in operation since February 1983 producing tofu for the local market. Our most recent product is Vegetarian Sausages which are selling extremely well." The Label is 4.5 by 3 inches. The product is subtitled "A healthy alternative." Atop the front panel is written: "No preservatives. No cholesterol. High protein. Low salt. No artificial flavours or colors. Pre-cooked. Dairy free."

Real Label sent with letter by Bruce Trevett & Jan Batchelar. 1992. Jan. 23. Blue and green on white. The product was introduced in March 1991.

1275. Fehlberg, Eric C. 1991. The sale of Granose Foods to the Haldane Foods Group and British Arkady Ltd. (Interview). *SoyaScan Notes.* April 30. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The sale of Granose took effect from 1 Jan. 1991. At the time of the sale, Granose was doing very well financially. The only year that they didn't break even or make a profit was 1990. At the beginning of 1990 they moved from their old building into the new one; the expenses connected with the move took upmost of their profits. In all other recent years they have been making good money, and a portion of that money has been contributed to the church. Mr. Fehlberg cannot understand why the church would sell such a thriving company.

But the board of the directors of the British Union of the Seventh-day Adventist church got an offer (which was a little bit of back-door work) that was too good to refuse, so they looked at it in their committee meeting and decided to accept it. They have a good understanding of all aspects of the company. This is the second long-established Seventh-day Adventist food company that has been sold by the church during the last 2 years. Loma Linda Foods was sold to Worthington Foods in Jan. 1990. Most of the employees of Granose have stayed with the company after the sale. Peter Archer, the former general manager, has stayed but is no longer the general manager. He is now marketing manager. The church no longer has any involvement with Granose at all.

We cannot say that these two sales are the start of a trend, but he is quite sure that the four Scandinavian Adventist food companies (Nutana in Denmark, Sweden, Norway, and Finland) will be the next to be sold. Nutana-Sweden is in considerably better financial shape than the other three, and Nutana-Finland is in pretty good shape. Nutana in Denmark and Norway are losing money and are very much in trouble. But he thinks that can easily be corrected if they get their costing straight and price their products based on their real costs. The man who has gone in to make these changes, Jan Paulsen, has as good a chance of succeeding as anyone, but he works out of London, England and does not have a much time for the health food work. He feels that the church should not be in the business of selling healthy foods. He influenced the board of the British Union in their decision to sell of Granose.

After the Scandinavian Nutana companies, the Egypt Food Factory, run by Mokhtar Nashed in Helipolois, Cairo, Egypt may well be the next to go, probably within the next few months. They used to make soymilk but he thinks they no longer are making it. Their products are "sub-standard" but still good. Superbom in Brazil is also having a hard time because of the adverse exchange rate and the desire to borrow money from the church. Superbom Chile is also having some problems.

But many of the Adventist food companies definitely will not be sold by the church in the foreseeable future. In fact, in the Far Eastern Division, a new food company in Hong Kong, run by Mr. Menzies, is scheduled to start selling products in early June of 1991. A new company is also starting in Thailand. Sahm Yook in Korea is also very successful, as is DE-VAU-GE in Germany and Sanitarium Foods in Australia. The food companies in Central America (Mexico, Costa Rica) and the Caribbean (Trinidad) are all doing well.

There are various administrative "Unions" within the Seventh-day Adventist Church. There are 4-5 unions in North America, 4 in Australia, many in South America, etc. The South American ones report to one central office in Brasilia, Brazil. The Central American food companies report to Miami, Florida. Sometimes a company manager and the head of the Union (a church official to whom he reports) have different ideas of what needs to be done at the company. These two men live in two different worlds, yet both have input in running the company. This can be a cause of business problems. The Mormon church owns some food companies and has the same type of problems. Address: Director, International Health Food Assoc., Seventh-day Adventist General Conference, 12501 Old Columbia Pike, Silver Spring, Maryland 20904. Phone: 301-680-6674.

1276. Takahashi, Nobuo. 1991. Vegetable soybean varietal improvement in Japan–Past, present and future. In: S. Shanmugasundaram, ed. 1991. Vegetable Soybean: Research Needs for Production and Quality Improvement. Taipei, Taiwan: Asian Vegetable Research and Development Center (AVRDC). 151 p. See p. 26-29. Proceedings of a workshop held at Kenting, Taiwan 29 April–2 May 1991.
• ***Summary:*** Contents: Abstract. Introduction. Breeding system. Breeding objectives. Genetic resources. Future prospects.

Vegetable soybeans grown in Japan are consumed late in the summer, mainly in July and August, and therefore very early or early varieties are used. They are ready to harvest about 90 days after the seeds are planted. Those consumed in the winter are imported from Taiwan, Thailand, or New Zealand. The breeding goal is a high yield of 9-10 tonnes/ha. In olden times vegetable soybeans were used as an offering at festivals during O-bon (August 16) and Tsukimi (Sept. 9).

Table 1 titled "Main vegetable soybean varieties" (p. 27) contains the following columns: Variety, breeding system (local variety, pedigree, cross, mutation–radiation), maturity (early to late), pod size, pubescence color, seed coat color, notes (incl. place or name of developer, incl. private seed co.). The following varieties are listed: Datcha, Krosai-chamame, Hiradoko, Tanbaguro, Okuhara 1 gou, Wase Midori, Tokyo Wase, Saporo Midori, Yukimusume, Mosono Green, Kita no Siki [Shiki], Green-75, Echigo Musume, Hatu [Hatsu] Musume, Iwa-mame-kei 1, Experiment Station, Iwa-mame-kei 4. Address: Nagano Chushin Agric. Exp. Station, Nagano, Japan.

1277. **Product Name:** Tofu.
Manufacturer's Name: Soycountry.
Manufacturer's Address: Westbrook (farm), Berrigan, NSW 2712, Australia. Phone: 060-356-215.
Date of Introduction: 1991. June.
New Product–Documentation: Letter from Rick Pyle, owner. 1991. July 10. "I am using a Takai W30B model tofu system to manufacture tofu and have just started last month." The telephone operator in New South Wales says that Berrigan is near Aubrey and Shepparton, but has no phone number listed for Soycountry.

Letter (fax) from then talk with Rick Pyle. 1992. Aug. 26 and Sept. 1. This company, owned by him, his wife Libby, and his father Max, has been making tofu for more than a year. They use both nigari and calcium sulfate as coagulants. He and his father also grow soybeans in New South Wales, and they use their Bowyer variety to make their tofu. His father was a soybean pioneer in the area, growing the first crop of irrigated soybeans in southern New South Wales in the 1960s. Their main competitors are Earth Angel and Blue Lotus.

1278. Rabheru, Neil. 1991. New developments with Unisoy, soymilk, and Haldane Foods in England (Interview). *SoyaScan Notes.* Sept. 16. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Unisoy was acquired by the Haldane Foods Group on 21 Dec. 1990. This has proved to be a very positive development for Unisoy. It is a great honor and very satisfying for Neil to be part of the same team with Dwayne Andreas and Peter Fitch, because both are very forward looking, energetic, and supportive men. The company now makes only soymilk. Other companies in the Haldane Foods Group now make the other soy products that Unisoy used to make–which is more efficient. For example, Genice Foods Ltd. makes soy margarine, yogurts, and ice creams. Unisoy plans to expand into a larger plant, probably at a new location. That phase, which will begin within 12 months, will involve an investment of £3 to £4 million. He is presently meeting with APV in connection with a new soymilk plant. Unisoy has not launched any new products since mid-1990. Neil has been too busy absorbing the Granose line into his production. Unisoy is now making all the soymilk that Granose used to buy from DE-VAU-GE, to use in continuing the Granose line of products that contain soymilk. Thus the Unisoy/Haldane now makes the profit that DE-VAU-GE used to make.

The acquisition of Granose by the Haldane Foods group was the most brilliant move one can imagine. 90% of the products that Granose was buying from other companies can be manufactured within the Haldane Foods Group. Granose's best products included their margarine, soymilk, ice cream, and yogurt. Peter Fitch deserves the credit for this stroke of genius.

The Haldane Foods Group now sells 4 soymilk brands, all now made by Unisoy: So Good (which used to be purchased from DE-VAU-GE; Sanitarium Foods in Australia only registered their brand in Australia and New Zealand), Granose, Unisoy, and White Wave. Neil believes that Unisoy makes the best-tasting soymilk in Europe today. Recently there was an independent magazine survey of all soymilks on the market and the Granose brand made by Unisoy won first, second, sixth, and ninth places. The UK soymilk market is extremely competitive and the prices are much lower relative to cow's milk than they are in the USA.

On average at all retail outlets, cow's milk retails for about £0.50 per liter versus £0.59 to £0.79 per liter for soymilk. Thus soymilk in the UK retails for about 38% more than cow's milk.

Note: In the USA, cow's milk retails for about $0.72/liter and soymilk retails for about $1.86/liter or about 2.6 *times* as much as cow's milk. The current exchange rate is 1.79 U.S. dollars = 1 British pound. Thus U.S. cow's milk would sell for £0.40/liter (20% less than British cow's milk) and soymilk would sell for £1.04/liter (about 45% more than British soymilk).

In the UK most of the soymilk is sold in the multiples (supermarkets) in half liters (500 ml) cartons, and that is where the greatest growth is. There, soymilk is only about 20% more expensive than cow's milk. (Note: In the USA very little soymilk is sold in supermarkets.)

In the UK, Provamel (made by Alpro in Belgium) has about 42% of the total soymilk market. The four brands made by Unisoy have about 35-37%. The remaining 21-23% is divided among Sunrise, Plamil, and a few others. There is very strong soymilk brand loyalty in the UK.

Unisoy increasingly refers to itself as "the soyamilk division of Haldane Foods Group." The "Milk 'n' By-Products Ltd." part of the name will be dropped very shortly.

The last part of the soyfoods market that the Haldane Foods Group will attempt to capture is tofu, since Cauldron Foods has a very big lead on Haldane in this market. The Granose line of dry mixes used to compete directly with the Haldane Food Group's Hera line. Now all these products are made at one location.

The relationship between ADM, British Arkady, and the Haldane Foods Group has changed. The Haldane Foods Group is no longer part of British Arkady; both are now on the same level on the organization chart, and both report directly to ADM's European headquarters (ADM International Ltd. in England; John R. Mahlich, managing director). Peter Fitch used to work for British Arkady before the Haldane Foods Group was formed. Address: Unit 1, Cromwell Trading Estate, Cromwell Rd., Bredbury, Stockport, Cheshire SK6 2RF, England. Phone: 061-430 6329.

1279. Stone, Kathy. 1991. Edamame: Fairmont firm grows and exports this soybean that is a favorite snack in Japanese bars and restaurants. *Minnesota Enterprise*. Sept. p. 12-13.
• ***Summary:*** Last year the Japanese ate 171 million pounds of edamame. The green vegetable soybeans are catching on in the United States and Jameson-Williams, a farm management firm in Fairmont, Minnesota, owned by James Lambert, is at the forefront of this agricultural export. The company employs 10 full time and 50 seasonal employees and had 1990 sales of $2.5 million.

The San Francisco (California) branch office of Japan's Nishimoto Trading Co. is the buyer of Jameson-Williams' edamame. Nishimoto is an importer and wholesaler of processed foods for Japan. Eiji Watanabe is the trading company's general manager.

"Duaine Flanders, technical services manager of the Agriculture Utilization Research Institute (AURI) in Morris, worked with the company to develop the technical expertise needed to process and handle edamame."

"With the help of a $50,000 matching grant from the Mid-America Agri-Trade Council (MIATCO), supported by the federal Foreign Agricultural Service, Jameson-Williams will be able to intensify promotion of its edamame know-how in Japan and Australia."

A photo shows James Lambert with Mike Nishihara (president) and Eiji Watanabe (general manager) of Nishimoto Trading Co.

1280. Univ. of Illinois, Dept. of Agronomy. 1991. You are cordially invited to attend a preview of the first fertile intersubgeneric hybrid between the soybean and a wild perennial relative from Australia. Turner Hall, Urbana, IL 61801. 4 p. Oct. Unpublished manuscript.
• ***Summary:*** Page 1 announces that the preview will take place on Wednesday, October 9, 1991, at 3:00 P.M. at Room 117, Turner Hall. Pages 2-4 are titled "The potential use of the wild perennial relatives of the soybean." "The overall goal of this project is to determine the potential usefulness of the wild perennial species in the genus *Glycine* for broadening the germplasm base of the soybean.

"Utilization of wild species for improvement of their cultivated counterparts is steadily increasing in various crops... Because of genetic remoteness and unique selection pressures on these wild perennial species in comparison with the soybean, there is a good possibility that they possess variation in economically valuable characteristics that may be missing in the soybean germplasm collections.

"Thus far, investigations have shown that wild perennial *Glycine* species carry resistance to soybean rust, yellow mosaic virus, powdery mildew and to brown spot. Accessions have been identified that are salt tolerant, tolerant to certain herbicides and can be regenerated from protoplast, leaf, cotyledonary, petiole and hypocotyl tissue.

"Hybrids between the soybean and its wild perennial relatives show pod abortion and are totally sterile. The main focus of this research program is to overcome the sterility barrier by the use of tissue culture techniques and chromosome manipulation."

A table shows the species in the genus *Glycine* Willd., somatic chromosome number, genome symbols, and distribution. The 15 species listed in the subgenus *Glycine* are: *G. albicans* Tind. and Craven. *G. arenaria* Tind. *G. argyrea* Tind. *G. canescens* F.J. Herm. *G. clandestina* Wendl. *G. curvata* Tind. *G. cyrtoloba* Tind. *G. falcata* Benth.

G. hirticaulis Tind. and Craven. *G. lactovirens* Tind. and Craven. *G. latifolia* (Benth.) Newell and Hymowitz. *G. latrobeana* (Meissn.) Benth. *G. microphylla* (Benth.) Tind. *G. tabacina* (Labill.) Benth. *G. tomentella* Hayata.

All these species come from Australia. All but the last two have a chromosome number of 2n = 40, except *G. hirticaulis* which has 2n = 80. *G. tabacina* also comes from West Central and South Pacific Islands and has a chromosome number of 2n = 40 or 80. *G. tomentella* also comes from Papua New Guinea, Philippines, and Taiwan, and has a chromosome number of 2n = 38, 40, 78, or 80.

Page 4 is titled "Intersubgeneric hybrids between soybean and *Glycine tomentella* Hayata–progress and prospective." Address: Urbana, Illinois.

1281. Baumber, Derek. 1991. New developments with tofu and tempeh in New Zealand (Interview). *SoyaScan Notes*. Nov. 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Recently 2 new Chinese-run tofu shops have begun operation in Auckland, and a third has purchased a large, automated tofu-making machine for $100,000 and will soon start production. Their tofu is lower priced than that of Bean Supreme, which is New Zealand's largest tofu maker. Bean Supreme also makes an excellent soy ice cream, as well as tempeh (though they no longer advertise the latter). At least one of the Chinese companies is buying tempeh from Bean Supreme and selling it under their own label.

Derek has been making tempeh on a small scale for himself and friends for the past 4-5 years. He plans to start commercial tempeh production soon. After that, he would like to make a soy yogurt. Address: Choice of Foods, 334 Mt. Albert Rd., Mt. Roskill, Auckland, New Zealand. Phone: 629-0665.

1282. **Pruduct Name:** Tofu Luncheon [Traditional, Cajun Spice, or Eastern Smoke].
Manufacturer's Name: Bean Supreme Ltd.
Manufacturer's Address: P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: (09) 590 592.
Date of Introduction: 1991. November.
Ingredients: Incl. tofu.
Wt/Vol., Packaging, Price: 450 gm chub pack.
How Stored: Refrigerated.
Nutrition: Per 100 gm.: Protein 17 gm, carbohydrate 7.8 gm, fat (unsaturated) 15.2 gm, sodium 350 mg, calcium 181 mg, energy 981 kJoules.
New Product–Documentation: Letter and leaflet titled "Soy Revolution Brings Happiness" sent by Trevor Johnston, Managing Director of Bean Supreme Ltd. 1994. July 8. This product was introduced in Nov. 1991. The leaflet shows a color photo of the 3 flavors in chub packs surrounded plates containing as salad, stir-fried veggies and tofu, and several sandwiches. The leaflet states: "Tofu breakthrough–New product... Our aim in developing this new product was to create a flavoursome ready-to-eat form of Tofu that still retained the nutritional benefits that have made Tofu so popular. We're proud of the results and hope you like it too. Nutritionally in some areas its even better than Tofu itself as you can see from the following table..." Includes recipes for using tofu in Ratatouile and in Indonesian-style Peanut Casserole.

1283. **Product Name:** Organic Tofu.
Manufacturer's Name: New Dawn Enterprises.
Manufacturer's Address: Sheffield, Tasmania. Phone: (004) 91 1663.
Date of Introduction: 1991. December.
Ingredients: Incl. organically grown soybeans (imported from South Australia or Queensland), and natural nigari (originally from Japan).
Wt/Vol., Packaging, Price: 500 gm vacuum pack.
How Stored: Refrigerated.
New Product–Documentation: Letter from Brett Stephens, 436 Crisp St., Albury, NSW, 2640, Australia. 1991. Dec. 14. There is a new tofu maker in Sheffield, Tasmania (which is a state of Australia).

Letter from Trishala Shub. 1998. Jan. 8. She has been the sole producer of organic tofu in Tasmania for the last 6 years. "I will soon be joining forces with people from Organic Choice in the Hobart area and we hope to diversify, offering miso and tempeh as well as tofu and soy dairy products."

Talk with Trishala Shub. 1998. Jan. 18. She and her former husband, David, started this company in about 1991 by buying the tofu equipment from a church group that had been making tofu in Tasmania. She had been a vegetarian since about 1970-71. She made the tofu and her former husband, David, took care of the business side of things–until he found that they were earning only about $1/hour for their time making tofu. They owned 60 acres of land which was mostly bush, but 20 acres was used for organic farming of berries, medicinal herbs, etc. Their first product was organic tofu. In about 1992 they introduced Soyburgers, which contained tofu, okara, wheat, and spices. They were a formal business (paying taxes) for only about the first 6 months; after that they continued informally. After David left Tasmania, she was able to run the business and farm with the help of wwoof-ers (wwoof = willing workers on organic farms) and local people who wanted tofu but could not afford to buy it, so they worked for it instead. This system is popular in Australia, where there is a national register in which each farmer tells what kinds of things they do and grow on their farm. Backpacking tourists come to stay and work on the farms. They get free room and board, plus lots of education, in exchange for about 4-5 or more hours of work a day. Sometimes she would have 4 to 5 wwoofers at a time working on her farm and helping make tofu. She has taught tofu-making, yoga and leadlining to many Japanese wwoofers. She sold the equipment in June 1997 to the people from Organic Choice. Before starting her work with tofu, Trishala worked as an Ananda Margha missionary in the Philippines and India.

1284. **Product Name:** Wonder-Vite Soy Coola.
Manufacturer's Name: Blissquik (Natural) Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia. Phone: (077) 75 7109.
Date of Introduction: 1991.
Ingredients: Soybeans, carob powder, honey, water added.
Wt/Vol., Packaging, Price: 250 ml.
How Stored: Refrigerated.
New Product–Documentation: Label and letter sent by C.H. Lee. 1992. Jan. 20. 3 by 1.57 inches. Self adhesive. Dark blue and orange on pea green. "No preservative. No artificial colouring. Shake well before use." Note 1. This is apparently a carob soymilk. Note 2. The address shown above is printed on the label and letterhead but typed onto the letterhead is: Reply to: P.O. Box 197, Garbutt 4814. Phone: (077) 253947.

1285. **Product Name:** Wonder-Vite Biodynamic Loaf.
Manufacturer's Name: Blissquik Food Products.
Manufacturer's Address: 37 Hammett St., Townsville, QLD 4812, Australia.
Date of Introduction: 1991.
Ingredients: Organically grown whole grain stoneground wheatflour, soyflour, yeast sea salt, water added.
Wt/Vol., Packaging, Price: 680 gm packed in plastic bag.
New Product–Documentation: Letter and Label sent by C.H. Lee of Blissquik Food Products. 1992. Feb. 17. Plastic bag. 7 by 9 inches. Blue and yellow on white. "Absolutely no chemical additives, colour, or flavour... This loaf with its natural organic minerals, protein, vitamins, and dietary fibre will help give your body vitally needed nutrients. Once tasted... always loved." The date this product was launched is unknown.

1286. Hymowitz, T.; Bernard, R.L. 1991. Origin of the soybean and germplasm introduction and development in North America. In: H.L. Shands and L. Wiesner, eds. 1991-1992. Use of Plant Introductions in Cultivar Development: Proceedings of a symposium sponsored by Division C-1 of the Crop Science Society of America in Las Vegas, Nevada, 19 Oct. 1989. 2 vols. Part 1. CSSA Special Publication Number 17. Madison, Wisconsin: Crop Science Society of America (CSSA). 164 p. See p. 147-64. Chap. 9. Crop Science Society of America Special Publication No. 17. [34 ref]

• ***Summary:*** Contents: Introduction. Origin of the genus *glycine*. Origin of the soybean. Introduction of the soybean to North America (by Samuel Bowen in 1765). Experiment stations and technology. Introduced soybean germplasm. Cultivar development. *Glycine soja*. Wild perennial *glycine* species.

"The genus *Glycine* Willd is divided into two subgenera, *Glycine* and *Soja* (Moench) F.J. Herm. The subgenus *Glycine* contains 15 wild perennial species (Singh et al., 1988; Tindale and Craven, 1988). Thirteen of the species [*G. albicans* Tind. and Craven, *G. arenaria* Tind., *G. curvata* Tind., *G. canescens* F.J. Herm., *G. clandestina* Wendl., *G. curvata* Tind., *G. cyrtoloba* Tind., *G. falcata* Benth., *G. hirticaulis* Tind. and Craven, *G. lactovirens* Tind. and Craven, *G. latifolia* (Benth.) Newell and Hymowitz, *G. latrobeana* (Meissn.) Benth. and *G. microphylla* (Benth.) Tind.] are indigenous to Australia. All carry $2n = 40$ chromosomes (diploid) except for *G. hirticaulis* which is tetraploid, $2n = 80$.

"*Glycine tabacina* (Labill.) Benth. with $2n = 40$ or 80 chromosomes, has been found in Australia, Taiwan, south Pacific Islands (New Caledonia, Fiji, Tonga, Vanuatu, Niue) and west central Pacific Islands (Mariana, Ryukyu). All accessions of *G. tabacina* collected outside of Australia are tetraploid ($2n = 80$) and even within Australia, tetraploids predominate over diploid forms. *Glycine tomentella* Hayata has been found in Australia ($2n = 38$, 40, 78, or 80), Papua New Guinea ($2n = 40$, 78 or 80), Indonesia ($2n = 80$), Philippines ($2n = 80$), and Taiwan ($2n = 80$). Singh et al. (1987, 1989) demonstrated that the complexes of *G. tabacina* and *G. tomentella* evolved through allopolyploidization in Australia."

"The soybean was first introduced to North America in 1765 by Samuel Bowen, a seaman employed by the East India Company. Bowen brought soybean from China via London to Greenwich, his residence in the province of Georgia. Situated a few kilometers east of Savannah, the 180 ha of Greenwich (now a cemetery) became the center of his farming and manufacturing enterprises.

"By the late 1850s, soybean was evaluated for forage potential by many farmers throughout the USA (Hymowitz, 1987). However, the scientific approach for evaluating the crop had to wait until the emergence of the agricultural experiment stations at land grant institutions during the latter part of the nineteenth century."

Table 9-1 (p. 154-57) shows "Ancestral cultivars and their occurrence in pedigrees of U.S.- Canadian publicly developed grain-type soybean cultivars (excluding backcross-developed isolines covered in Table 3). Part A of this table is a summary by maturity group and part B is a summary by decade of release. Each part is divided into number of descendant cultivars, northern ancestors, southern ancestors, ancestors chosen for pest resistance, other, and number of ancestral cultivars. The ten most important northern ancestors (in descending order of importance with the number of occurrences in pedigrees in parentheses) are: Mandarin (143), Manchu (121), Richland (119), A.K. (108), Dunfield (83), Mukden (73), No. 171 (30), Pakota (27), L37-1355 (25), and Manitoba Brown (14). The 13 most important southern ancestors are: CNS (118), Tokyo (109), PI54610 (108), S-100 (82), Roanoke (42), Haberlandt (40), Arksoy (40), Palmetto (34), Biloxi (9), PI 60406 (7), Otootan (7), Laredo (4), Mammoth Yellow (5).

Table 9-2 (p. 158-59) shows the "Origins of major ancestral cultivars of the 221 cultivars developed at public institutions in the USA and Canada." For each cultivar is given: Descendant cultivars, maturity group, year of introduction, country and locality of origin, and original cultivar name.

Table 9-3 (p. 161) shows "Sources of genes backcrossed into domestic public soybean cultivars." The named varieties are Kanro, Mukden, Arksoy, Higan, Kingwa, and CNS. All 8 of the most important northern cultivars originated in China. Of the 12 most important southern cultivars, 9 originated in China, 2 in Korea, and 2 or 3 in Japan. Address: Univ. of Illinois, Urbana, Illinois.

1287. **Product Name:** Sungold (Soymilk).
Manufacturer's Name: Dairy Farmers Co-Operative Ltd.
Manufacturer's Address: 433 Victoria St., Wetherill Park, NSW 2164, Australia.
Date of Introduction: 1991?
New Product–Documentation: Letter from C.H. Lee of Blissquik Food Products. 1992. Feb. 17. This company currently makes Sungold brand soymilk. Gives name and address.

1288. **Product Name:** Soymilk.
Manufacturer's Name: Queensland Soybean Food Products Pty. Ltd.
Manufacturer's Address: 20 Cronulla Court, Slacks Creek, Brisbane, QLD 4127, Australia.
Date of Introduction: 1991?
New Product–Documentation: Letter from C.H. Lee of Blissquik Food Products. 1992. Feb. 17. This company currently makes soymilk. Gives name and address. The brand name is unknown.

1289. **Product Name:** Soybev, and Soykink (Soymilk).
Manufacturer's Name: Tixana Pty. Ltd.
Manufacturer's Address: 17 Elizabeth St., Campsie, NSW 2194, Australia.
Date of Introduction: 1991?
New Product–Documentation: Letter from Wataru Takai. 1987. Oct. 3. This company, run by John Tan, is located at 53 Sydenham Rd., Marrickville, NSW 2204, Australia. They plan to make tofu, and perhaps soymilk, shortly.

Letter from C.H. Lee of Blissquik Food Products. 1992. Feb. 17. This company currently makes Soybev and Soykink brands of soymilk. Gives name and address.

1290. **Product Name:** Herbed Tofu.
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484. Australia. Phone: (066) 72 5931.
Date of Introduction: 1992. January.
Wt/Vol., Packaging, Price: 375 gm vacuum packs.
How Stored: Refrigerated.
New Product–Documentation: Letter (fax) from Greg Nance-Kivell. 1996. April 2. "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse." Greg was asked to come in as a consultant in late 1991. This product was launched in Jan. 1992. Packed in vacuum packed bags.

1291. Larson, Donald W.; Rask, Norman. 1992. Industry note: Changing competitiveness in world soybean markets. *Agribusiness: An International Journal* 8(1):79-91. Jan. [11 ref]

• ***Summary:*** Contents: Introduction. World soybean production. Soybean and soybean product trade shares. Factors affecting competitiveness and trade: Costs of production, government policy. Conclusions. The GATT negotiations and the New Economic Order are based on the assumption of competitiveness in world markets. The landed cost of soybeans in Japan and at Rotterdam [Netherlands] favors Argentina and Brazil over the USA. The USA has steadily lost export market share for soybeans and soy products, from about 95% in early 1979 to 45% in 1990. During this time the Brazilian share has grown to 30% and the Argentine share to 16%. A fundamental shift from the export of soybeans to the export of more soybean products has occurred largely because of policies favoring product exports from Argentina and Brazil.

Tables show: (1) Soybean area harvested in six major producing countries in five groups of selected years from 1974 to 1990, and the percentage change during this time. The percentage changes are: Argentina +16,333%, Paraguay +10,000%, Brazil +96%, USA +20%, and China -43%. (2) Comparative soybean yields in the USA, Canada, Argentina, Brazil, Australia, and the world in 7 groups of years from 1975 to 1990. Canada usually has the highest yields. (3) Soybean production costs in Argentina ($127/acre), Brazil ($145/acre), and USA ($192/acre). (4) Production and marketing costs for soybeans landed in Rotterdam and Japan for Argentina, Brazil, and USA. In each port, Argentina has the lowest landed costs and USA has the highest.

Bar charts show: (1) Percentage shares of world soybean exports by major exporters (USA, EC-12, Argentina, Brazil, Paraguay, Others) 1980-1990. (2) Percentage shares of world soybean oil exports by major exporters (USA, EC-12, Argentina, Brazil, Others) 1980-1990. (3) Percentage shares of world soybean meal exports by major exporters (USA, EC-12, Argentina, Brazil, Others) 1980-1990. Address: Professors in the Dep. of Agricultural Economics and Rural Sociology, The Ohio State Univ.

1292. Nestel, Paul J.; Noakes, M.; Belling, G.B.; McArthur, R.; Clifton, P.M.; Abbey, M. 1992. Plasma cholesterol-lowering potential of edible-oil blends suitable for commercial use. *American J. of Clinical Nutrition* 55(1):46-50. Jan. [25 ref]

• ***Summary:*** The consumption of saturated fatty acids has been falling in countries that have experienced a decline in coronary heart disease. But concern remains about the nature of fats and oils used in commercially prepared foods. "In particular, palm oil (rich in palmitic acid), coconut oil (rich in lauric and myristic acids), and partially hydrogenated vegetable oils (because of their high *trans* fatty acid content) have been targeted as potentially undesirable."

The authors tested semihardened blends of edible oils, suitable for commercial food manufacture, with a lower-than-conventional saturated fatty acid content, for their effects on plasma cholesterol. Twenty-six men with slightly higher than normal blood cholesterol levels participated in a double-blind crossover experiment.

"The *trans* fatty acid (mainly elaidic) content of the blends was 16%, raising its contribution to energy by 4% but without apparent effect on LDL and HDL concentrations. Provided the overall ratio of linoleic acid to palmitic acid in commercial edible-oil blends exceeds that in the prevailing national diet, partial hydrogenation will not negate the LDL-lowering potential." Address: CSIRO Div. of Human Nutrition, P.O. Box 10041, Gouger Street, Adelaide, South Australia 5000, Australia.

1293. Lee, C.H. 1992. Re: Companies presently making soymilk in Australia. Letter to William Shurtleff at Soyfoods Center, Feb. 17–in reply to inquiry. 1 p. Typed, with signature.

• ***Summary:*** Sanitarium Health Food Co. (Wahroonga, NSW) makes So Good. Berrivale Orchards Ltd. in Berri, SA, makes Soypreme. Dairy Farmers Co-OPerative Ltd. in Wetherhill Park, NSW, makes Sungold. Tixana Pty Ltd. in Campsie, NSW, makes Soybev and Soy Kink. Queensland Soybean Food Products Pty. Ltd. in Brisbane, QLD, makes an unknown brand, and Blissquik Food Products in Townsville, QLD, makes Wonder-Vite Soymilk Drinks (plain or flavoured). Address: Owner, Blissquik Food Products, P.O. Box 197, Garbutt [37 Hammett St.], Townsville, QLD, Australia.

1294. Kushi, Michio. 1992. Introduction to *Culinary Treasures of Japan*, by John and Jan Belleme. 16 p. Jan. Unpublished manuscript.

• ***Summary:*** This manuscript, which was published in a condensed form in the actual book, tells the story of Mitoku and their work to export traditional Japanese natural foods to the Western world. Michio Kushi was instrumental in getting Mr. Akiyoshi Kazama involved in this work. Mr. Kushi, who became a World Federalist after World War II, came to the U.S. in Nov. 1949 to study at Columbia University. He continuously sought ways of establishing world peace, and increasingly came to believe that a proper diet is the basis for health, happiness, and peace.

In April 1966 the author's wife, Aveline, opened a small store named Erewhon in Boston. Michio began to search for a Japanese source for foods that Erewhon would sell. He was introduced to Mr. Kazama (who lived in Tokyo) through a Japanese friend, Mr. Obayashi, who resided at that time in New York City. Michio felt that Mr. Kazama understood his desire for foods of high quality. So Mr. Kazama "began his search for food producers and manufacturers who were sincere and willing to supply the kind of quality we requested. I know that for him, at that time, it was a great gamble. It was also a painstaking and slow step-by-step process."

Mr. Kazama was born on 1 Feb. 1930 in Yamanashi prefecture. He graduated from Waseda University in Tokyo, then was selected to study business in the United States. After arriving in Chicago, Illinois, he was drafted by the U.S. government to serve in the American Army in Korea and in Japan from 1956 to 1958. Upon his return to Japan, he settled in Tokyo where he became an import agent for a German company dealing in optics and electronics. After the Kushis contacted him, he became involved in the emerging natural food business. [He founded a company named Mitoku. Mi = Michio. To = Tomoko (Aveline's given name in Japanese). Ku = Kushi].

In 1968 Mr. Kazama made his first shipment of Japanese natural foods to Erewhon; the order was worth $3,000. The Kushis first met Mr. Kazama in Boston in 1970. Over the years, the volume of Mitoku's exports steadily grew, and expanded to Europe, Australia, and the Middle East. Today Mitoku ships its products to about 35 countries. Approximately 40% of Mitoku's exports go to America, 40% to Europe, and 20% to Australia and other regions. Annual sales are about $10 million. Among the major suppliers are Sendai Miso Shoyu Co. Ltd., Hatcho Miso Co. Ltd., Hagoromo Miso, Ltd., Hanamaruki Miso Co. Ltd, San Iku Foods Co. Ltd.

Distributors of Mitoku's products include the following: In the USA: Westbrae Natural Foods Inc., Great

Eastern Sun Inc., U.S. Mills Inc., Tree of Life Inc., and Shojin Natural Foods (Hawaii). In Canada: Koyo Foods Inc., Flora Distributors Ltd., and Timbuktu. In Costa Rica: Distribuidora de Productos Macrobioticos S.A. In England: Sunwheel Foods Ltd. Clearspring Natural Grocer. Meridian Foods Ltd. In France: Celnat, Tama. In Belgium: Lima N.V. In the United Arab Emirates: Emirates Trading & Marketing Est. In South Africa: Key Health. In Austria: Naturkostladen, Lebenszeichen. In Switzerland: S'lotusbluemli, Terrasana, Futonhaus. In Sweden: Kung Markatta. In Norway: Alternative Import. In Finland: Makro Bios. In Portugal: Armazens Da Matinha. In Spain: Kunga. In Italy: La Finestra Sul Cielo, Probios S.R.L., Dalla Terra al Cielo, Solo Natura. In Israel: Tivoli Ltd. In Australia: Pureharvest. In New Zealand: Enso. In Singapore: Nature's Best. In Yugoslavia: General Export. In Japan: Seibu Department Stores Ltd., Tokyu Department Stores Ltd. Among the countries reached indirectly through transshipment are Hungary, reached through Austria, various South American countries reached through the United States, and other countries such as Poland. Czechoslovakia, Iceland, Andorra, Ireland and the Caribbean Islands."

As Mitoku developed its international operations, Mr. Kazama hired many students from Western countries, including Blake Rankin (USA), Ferro Ledvinka (Italy), Christopher Geoffrey Dawson (New Zealand, starting 1979), Robbie Swinnerton (England), Terrie Adams (USA), and Michelle Harbroun (France).

"For the past 10 years, Mitoku has echoed and supported the macrobiotic perspective with its motto 'Isshoku-Dogen.' These words, though they have been forgotten in the last few centuries by the very people in the health care field who should remember them well, mean literally 'medicine and food have the same source,' and can be translated as 'food *is* medicine.' This saying has been used and known as part of the ancestral heritage of wisdom transmitted from generation to generation for several thousand years in Oriental countries such as China, Korea and Japan.

"In an attempt to preserve Japanese traditions, Japan has instituted a 'Living Treasures' program granting official recognition and support to [living masters in] various cultural areas such as theater, music, dance, sculpture, carpentry, weaving... and arts and crafts. Ironically, though, Japan has not granted the same official recognition to its traditional methods of food processing and production in spite of the fact that increasingly large numbers of people throughout the world are now appreciating traditionally processed Japanese food products and have become aware of their important health benefits. The Japanese traditional arts of producing miso, soysauce, tofu, natto, amazake, rice vinegar, sake, mirin, condiments and pickles as well as cooking methods and preparation are unique among the culinary practices of the world... These foods are also works of art... It is my hope and recommendation that official recognition and support be granted by the 'Living Treasures of Japan' to those who have dedicated their life to the traditional art of food production and processing in spite of the hardships and commercial disadvantages they are compelled to face in business competition and present-day economical conditions." Address: 62 Buckminster Rd., Brookline, Massachusetts 02146.

1295. Singh, R.J.; Kollipara, K.P.; Ahamd, F.; Hymowitz, T. 1992. Putative diploid ancestors of 80-chromosome *Glycine tabacina. Genome* 35(1):140-46. Feb. [27 ref]

• ***Summary:*** "The objective of this study was to discover the diploid progenitors of 80-chromosome *Glycine tabacina* with adventitious roots (WAR) and no adventitious roots (NAR)...

"*Glycine tabacina* (Labill.) Benth. is 1 of the 15 wild perennial species of the genus *Glycine* Willd. subgenus *Glycine*, which includes both diploid (2n = 2x = 40) and tetraploid (2n = 4x = 80) cytotypes. Diploid G. *tabacina* is indigenous to Australia, while the tetraploid cytotype is found sympatrically with diploids in Australia and in the islands of the south Pacific (New Caledonia, Vanuatu, Fiji, Tonga, Niue) and west central Pacific (Taiwan, Ryukyu [Japan], Marianas)." Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1296. Whiteman-Jones, Michael. 1992. Soyfoods poised for growth: New mass-market interest, product development and consumer interest are driving sales higher than ever. *Natural Foods Merchandiser.* Feb. p. 18-19.

• ***Summary:*** Last year soyfoods were introduced to mass-market consumers by two of America's corporate giants. (1) Archer Daniels Midland Co. (ADM of Decatur, Illinois) introduced the vegeburger to show that a delicious food product could be made from soy. ADM marketing specialist Lee Lensch says the soy burger is doing very well in test markets in Indiana, Illinois, and Minnesota. Versions of the product are being advertised nationally in corporate TV spots and on local TV in test markets. Buyers who gave the products shelf space at chains such as Kroger, SuperValue and Cub Foods now report brisk sales. (2) Protein Technologies International in St. Louis, Missouri, a subsidiary of Ralston Purina, is test marketing a soy-based beverage named First Alternative in Phoenix, Arizona.

Peter Golbitz, president of Soyatech Inc., a consulting company in Bar Harbor, Maine, notes that since the 1980s, Japanese companies (such as Nichii Co.) have invested at least $50 million in soyfoods manufacturing plants in the U.S.

"Retail sales of soyfoods are growing in America by about 5 to 7 percent a year, increasing to about $657 million in 1990, Golbitz says. The most rapid expansion is for soy milk, which is growing at a rate of about 20% a year, and second-generation soyfoods which are growing at a rate of about 15%... Soy milk consumption in Australia, where it is sold in grocery stores like milk, is about 10 times what it is in this country."

Worldwide, consumption of soyfoods now averages about 1.7 kg/person/year, and is expected to rise to 2 kg or more by the year 2000. Taiwan is the world leader with 15.5 kg/capita/year of soy, followed by Japan at 11.1 kg. A world map and table (largely compiled from FAO Food Balance Sheets) shows "Soyfood consumption: Yearly average per capita (Amount of change from 1979 to 1988)." The following countries are listed in descending order of consumption in kg/capita: Korea 17.1 kg (2.4%). Taiwan 13.0 (37.0%). Japan 10.8 (6.7%). Indonesia 6.3 (57.4%). Hong Kong 3.8 (-22.0%). Saudi Arabia 3.6 (342.9%). China 3.4 (-5.6%). Paraguay 2.8 (50.0%). Malaysia 2.3 (102.2%). Thailand 1.6 (162.5%). Zimbabwe 1.6 (22.2%). United States 1.4 (33.3%).

1297. Jacobs, Lenny. 1992. Macrobiotic pioneers–where are they now? (Interview). *SoyaScan Notes.* May 27. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Nahum Stiskin is now in New York City in the field of investments. His former wife, Beverly Stiskin, lives in Brookline, and is an Alexander therapist. Nahum has a black cloud and a real bitter feeling regarding his past life. He doesn't like to talk with people. Lenny ran into him 8 years ago at an ABA show and he said to Lenny, "Don't bother me." Mr. Ehud Spurling, the owner of Inner Traditions Press in Rochester, Vermont also knows how to reach Nahum.

Bill Garrison is on the West Coast somewhere. He applied for the job of financial manager of the Kushi Foundation. Anthony "Tony" Harnett is owner of Bread and Circus in Newton, Massachusetts. Jim Ledbetter is in Southern California; the Kushis keep in touch with him. Jim started *Order of the Universe* magazine. Robert Hargrove is in the Brookline area where he owns Robert Hargrove and Associates.

Nik Amartseff got involved with cocaine at some point in about the late 1970s and his life fell apart. But now its back together.

Marcea Newman now lives in Australia; Lenny saw her at Anaheim not long ago and spent a lot of time with her and her husband (who has designed a very interesting Chinese herbal database on a Macintosh computer); its a very expensive diagnostic tool. You can enter your symptoms and it will suggest which herbs to take, or you can key in the name of an herb, and it will tell you all about it.

Eric Utne was the manager of Erewhon in about 1970 or 1971. He came to Boston in the late spring of 1969, at the same time as Lenny's wife to be. Lenny arrived in Boston in the summer of 1969 from Chicago, Illinois. He left Boston for Minneapolis in 1971; then Eric Utne, Lenny, and Peggy Taylor (who is now the editor at *New Age Journal)* started a restaurant at the University of Minnesota named Whole Foods. They ran it for 2 years. Then Eric and Peggy returned to Boston, and Eric went to work at the *East West Journal.* Lenny left for Boston in the fall of 1973; he wanted to start a bakery, then he and Bob Phelps (who now runs Redwing Books) planned to start a seaweed harvesting business. The Robert Hargrove, Eric Utne, and several other people (the majority of the staff of East West Journal) asked Michio Kushi to either give them the magazine (free of charge) or they would quit. They did quit and started New Age Journal. Michio Kushi asked Lenny if he would please work for East West for a few months, which he did–though he ended up staying for years until he finally left to work at East West Journal.

The Seventh Inn was a really successful restaurant, but Michio refused to share any of the ownership with the people who ran it and he tried to control it too much. Originally called Sanae, it was started by Richard Sandler (who selected the location and designed the kitchen, but never really worked there after it was in business), Evan Root, and others. Lenny was a cook there. Richard and another guy named Warren Durban quit before the restaurant was finished, and they gave it over to Lenny and Bill Anton (who is still in Japan). Then Yuko Okada and Hiroshi Hayashi started to run it; they changed the name to The Seventh Inn. There were two Sanae Restaurants, one on Newbury St. and the other on Boylston St. Address: New Age, Brighton, Massachusetts. Phone: 617-787-2005.

1298. **Product Name:** Tofu, and "Soya Sage" Soysage.
Manufacturer's Name: Basically Beans "Real Food."
Manufacturer's Address: P.O. Box 170 Nimbin, NSW 2480, Australia. Phone: (066) 89 1565.
Date of Introduction: 1992. May.
New Product–Documentation: Form filled out by Simon Elenius. 1993. May 21. His company began production of these two products in May 1992. Present production is 600-900 lb/month of tofu and 250-300 lb/month of soysage.

1299. Okada, Yuko. 1992. How Muso Shokuhin brought soymilk to America (Interview). *SoyaScan Notes.* July 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Muso wanted to introduce Marusan's soymilk in the foil retort pouch to the USA. They began looking for a major American distributor. First they offered the product to Mike Potter of Eden Foods when Mike was in Japan, but he was not interested because he did not think the product would sell in America. Then they offered the product to Jimmy Silver of Pure Sales; he thought it was a weird product. Then they offered it to Knudson, but Knudson was not interested. Then they offered it to Matt Sandler, who also turned it down.

The first place this soymilk really sold outside Japan was in Australia; Jim Wilson, owner of Spiral Foods in Australia started importing this soymilk (which was named Bonsoy) from Muso in about 1979, packaged in a foil retort pouch. Mike Potter met Jim Wilson at a natural foods convention in Anaheim, California; Muso brought Jim Wilson to the convention and arranged this meeting. Wilson told Potter that Bonsoy sold very well in Australia. Potter told Ron Roller to go to Japan to check out this product–which Ron did. Finally the product was launched at the NNFA show in Denver, Colorado, under the name Edensoy by Eden Foods.

The product named Bonsoy was first sold (exported) by Muso to Spiral Foods in Australia in about 1979. Then it was sold to Bean Supreme in New Zealand in about 1981; Bean Supreme had also promoted the Spiral Foods label. Then it was exported by Muso to Urtekram in Denmark in about 1988, and the it was exported to Mimasa in Spain in about 1990. Address: Muso Co., Ltd., Kosei Bldg., 2nd Floor, Tanimachi 2-5-5, Chuo-ku, Osaka 540, Japan. Phone: 1. 06-942-0341.

1300. Nestel, Paul; Noakes, M.; Belling, B.; McArthur, R.; Clifton, P.; Janus, E.; Abbey, M. 1992. Plasma lipoprotein lipid and LP[a] changes with substitution of elaidic acid for oleic acid in the diet. *J. of Lipid Research* 33(7):1029-36. July. [27 ref]

• ***Summary:*** The effect on plasma lipids of additional dietary *trans* fatty acids (7% energy) was assessed in a double-blind comparison of four separate diets. The authors "conclude that three weeks consumption of *trans* fatty acid (mainly elaidic) at about 7% energy (probably twice the Australian average) results in LDL cholesterol levels that do not differ from those seen with diets enriched with palmitic acid or butter fat and are higher than when oleic acid was substituted for elaidic acid."

Talk with Dr. E. Emken. 1992. Nov. 5. This is a better reference to the effects of *trans* fatty acids on serum cholesterol than the other 1992 article by Nestel in *American Journal of Clinical Nutrition.* The data is a little cleaner and clearer. Address: CSIRO Div. of Human Nutrition, Adelaide, South Australia, Australia; and St. Vincent's Hospital, Melbourne, Australia.

1301. **Product Name:** Tofu Tempeh Burger, Tofu Vegies Burger.

Manufacturer's Name: Nutrisoy Pty. Ltd.

Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.

Date of Introduction: 1992. August.

Ingredients: Organic soybean (non genetically modified), water, soy sauce, sunflower oil, spices, natural nigari (magnesium chloride), culture *(Rhizopus oligosporus).*

Wt/Vol., Packaging, Price: 200 gm.

How Stored: Refrigerated.

New Product–Documentation: Label and letter (e-mail) from Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these two products in Aug. 1992. Note: He invented this interesting Tofu tempeh Burger.

1302. Petka, Tom. 1992. The casein industry and market (Interview). *SoyaScan Notes.* Sept. 14. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Casein became classified as a chemical and a non-dairy product in about 1948-49 by the Federal Trade Commission, at about the same time that price supports for dairy products began. At that time it was used almost exclusively for industrial applications (such as adhesives and sizings) rather than in foods. Today about 80% of the casein in America is used for foods–mainly imitation cheeses, whip toppings, and other imitation dairy products, plus medical and nutritional products prescribed by doctors. The remaining 20% is used for industrial purposes–mainly adhesives and sizings.

There are presently no companies in America that make casein; government price supports for milk price it out of the world market. The last U.S. manufacturer, Land O'Lakes, stopped in the 1970s. All casein used today in America is imported, mainly from New Zealand, Ireland, France and the Netherlands.

Note: If this outdated and misleading classification of casein as a non-dairy product could be changed, it would open up a huge market for soy protein products (isolates, soymilk, tofu), primarily in foods and beverages. Address: American Casein Co., 109 Elbow Lane, Burlington, New Jersey 08016. Phone: 609-387-3130.

1303. Hesser, J.M. 1992. The world wheat gluten market (Interview). *SoyaScan Notes.* Oct. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In March 1981 Matt took over management of the International Wheat Gluten Assoc. (IWGA); it was the first association he managed. At the time, there were 11 members, all manufacturers of dry powdered wheat gluten from Canada, Australia, and American. His first project was to bring European (western and eastern), and Japanese manufacturers into the association. Today the IWGA has 23 members from around the world; all are still manufacturers of dry powdered wheat gluten. The annual output of the individual member companies ranges from about 4,000 tonnes to 35,000 tonnes. Companies that make wet wheat gluten tend to be very small, often cottage industries.

IWGA publishes a quarterly newsletter sent to members and an annual newsletter with a circulation of about 350. Address: International Wheat Gluten Assoc., 4510 W. 89th St., Prairie Village, Kansas 66207. Phone: 913-341-1155 or 1156.

1304. **Product Name:** Roberts Soy Fibre Flour.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1992. October.
Ingredients: 1995: Made from the hull, bran or skin of Australian grown soybeans.
Wt/Vol., Packaging, Price: 500 gm plastic bag.
How Stored: Keep sealed. Store in a cool, dry, dark place.
New Product–Documentation: Package with Label sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. "Roberts Soy Fibre Flour. 7 by 9 inches. Yellow, red, black, and green on white. "Low fat. Gluten free. Cholesterol free. High dietary fibre. Keeps you regular. Product of Australia. Letter from Paul Smith. 1994. March 14. This product is made by finely grinding soybean hulls.

1305. **Product Name:** Roberts Soy Grits–Debittered.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1992. October.
Ingredients: Australian-grown soybeans.
Wt/Vol., Packaging, Price: 500 gm plastic bag.
How Stored: Keep sealed. Store in a cool, dry, dark place.
New Product–Documentation: Package with Label sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. Roberts Soy Grits. 7 by 9 inches. Yellow, red, black, and green on white. "A versatile food. Gluten free. Cholesterol free & full of beans. Product of Australia."

Letter from Paul Smith. 1995. March 14. Lowans, Kadak, Select Foods, and other companies have also packaged this product under their names and brands for many years previously.

1306. **Product Name:** Roberts Soy Flour–Debittered.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1992. October.
Ingredients: Australian-grown soybeans.
Wt/Vol., Packaging, Price: 500 gm plastic bag.
How Stored: Keep sealed. Store in a cool, dry, dark place.
New Product–Documentation: Package with Label sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. Roberts Soy Flour. 7 by 9 inches. Yellow, red, black, and green on white. "A versatile food. Gluten free. Cholesterol free & full of beans. Product of Australia."

Letter from Paul Smith. 1995. March 14. Lowans, Kadak, Select Foods, and other companies have also packaged this product under their names and brands for many years previously.

1307. **Product Name:** Roberts Soy Flour–Lightly Steamed.
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1992. October.
Ingredients: Australian-grown soybeans.
Wt/Vol., Packaging, Price: 500 gm plastic bag.
How Stored: Keep sealed. Store in a cool, dry, dark place.
New Product–Documentation: Package with Label sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. Roberts Soy Flour–Lightly Steamed. 7 by 9 inches. Yellow, red, black, and green on white. "Gluten free. Cholesterol free & full of beans. Product of Australia."

1308. Avian Technology. 1992. Would you believe this bird is just 11 weeks old? Crimson rosella. Premature maturation (Ad). *Australian Birdkeeper.* Oct/Nov. p. 243.
• ***Summary:*** This full-page color ad shows a colorful red and blue bird sitting on a perch. It was: "Handreared from an artificially incubated egg. Reared on Roudybush Formula 3 handfeed. Need we say more?" Roudybush is a manufacturer of bird feeds. The Roudybush logo at the bottom of the page is composed of a bold letter "R" with the head of a tropical bird inside it. Beside it we read: "Club and dealer enquiries welcome." Address: P.O. Box 831, Newcastle, NSW 2030 Australia. Phone: (049) 545 739.

1309. *SoyaScan Notes.*1992. Chronology of major soy-related events and trends during 1992. Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** June–Many parrots owned by Richard and Valerie James of Whangerei, New Zealand, begin to die inexplicably. They make every effort to determine the cause of these deaths, and finally come to believe that soybean meal in their bird feed has caused the deaths. This is the beginning of the anti-soy movement worldwide.

1310. **Product Name:** Soy Burgers.
Manufacturer's Name: New Dawn Enterprises.
Manufacturer's Address: Sheffield, Tasmania. Phone: (004) 91 1663.
Date of Introduction: 1992.
Ingredients: Incl. organic tofu, okara, wheat, and spices.
Wt/Vol., Packaging, Price: 500 gm vacuum pack.
How Stored: Refrigerated.
New Product–Documentation: Talk with Trishala Shub. 1998. Jan. 18. In about 1992 they introduced Soyburgers, which contained tofu, okara, wheat, and spices.

1311. Steele, M.G. 1992. The effect on serum cholesterol levels of substituting milk with a soya beverage. *Australian J. of Nutrition and Dietetics* 49:24-28. *

1312. Asian Vegetable Research and Development Center. 1992. Annotated bibliography of soybean rust (*Phakopsora pachyrizhi* Sydow). Shanhua, Taiwan: AVRDC. 160 p. Author index. Subject index. Geographical index. 26 cm. AVRDC Library Bibliography Series No. 4-1. [480 ref]
• ***Summary:*** This publication supersedes an earlier edition published by AVRDC in 1987. It includes an additional 160 citations covering the period 1985 to May 1991.

Compiled by P.L. Hwang, F.C. Chen, and C.C. Wei, this bibliography contains abstracts of documents about soybean rust which are available in the AVRDC Library. Contents: Explanatory note, general information, pathogen morphology and taxonomy, physiology and biochemistry, epidemiology, pathogenic specialization, etiology, yield loss, and disease management (incl. general, chemical control, biological control, host resistance, cultural control).

Countries or continents mentioned in the index at geographical distribution of soybean rust: Africa, Asia, Australia, Brazil, Cambodia, China, Columbia, Costa Rica, Cuba, Guatemala, India, Indonesia, Israel, Japan, Korea, Latin America, Malaysia, Nepal, Papua New Guinea, Philippines, Puerto Rico, Soviet Union, Sri Lanka, St. Thomas, Suriname, Taiwan, Thailand, Togo, United States, West Indies, Venezuela, Vietnam, Zambia. Address: P.O. Box 42, Shanhua, Tainan 74199, Taiwan.

1313. Food and Agricultural Organization of the United Nations. 1992. Soybeans: Area harvested, yield, and production. *FAO Yearbook–Production (Rome, Italy)* 46:115-16.
• ***Summary:*** The following nations are listed for the first time as soybean producers in the *FAO Production Yearbook*. F = FAO estimate. * = Unofficial figure. Burkina Faso: Harvested 5,000F ha in 1990, 1991, and 1992.

Panama: Harvested 1,000 ha per year in 1979-1981, 7,000 ha in 1990, 6,000 ha in 1991, and 3,000 ha in 1992.

Honduras is no longer listed, but reappeared in 1994. Achieved yields of 747 kg/ha in 1991.

Syria: Harvested 5,000* ha in 1991 and 1992.

Albania: Harvested 4,000 ha in 1979-81, 10,000 ha in 1990, 9,000F ha in 1991, and 10,000F ha in 1992. Note: This is the earliest document seen (May 2003) that contains statistics on soybean production in Albania.

Bosnia and Herzegovina: Harvested 8,000 ha in 1990, 6,000* ha in 1991, and 5,000F ha in 1992.

Croatia: Harvested 27,000 ha in 1990, 23,000 ha in 1991, and 26,000 ha in 1992.

Macedonia: Achieved yields of 1,314 kg/ha in 1990, 1,833 kg/ha in 1991, and 1,600 kg/ha in 1992.

Slovenia: Achieved yields of 1,692 kg/ha in 1990, 2,000 kg/ha in 1991, and 978 kg/ha in 1992.

Former Soviet Republics–Azerbaijan: Harvested 1,000* ha in 1990, 1,000* ha in 1991, and 1,000F ha in 1992.

Georgia: Harvested 8,000 ha in 1990, 6,000 ha in 1991, and 6,000F ha in 1992.

Kazakhstan: Harvested 23,000* ha in 1990, 18,000* ha in 1991, and 19,000F ha in 1992.

Moldova: Harvested 26,000* ha in 1990, 20,000* ha in 1991, and 20,000F ha in 1992.

Russia (Russian Federation): Harvested 741,000 ha in 1979-81, 675,000 ha in 1990, 664,000 ha in 1991, and 632,000 ha in 1992.

Ukraine: Harvested 69,000 ha in 1979-81, 87,000 ha in 1990, 100,000 ha in 1991, and 100,000F ha in 1992.

Thus in 1992 the former Soviet Union harvested 800,000F hectares of soybeans. The leading countries, in descending order of soybean production, were Russia, Ukraine, Moldova, and Kazakhstan.

1314. McGarry, Michael J.; Schmitz, Andrew. 1992. The world grain trade: Grain marketing, institutions, and policies. Boulder, Colorado: Westview Press. xx + 510 p. Illust. No index. Maps. 24 cm. [15 soy ref]
• ***Summary:*** This very interesting book, which is crippled by the lack of an index, has the following contents: Part I: Argentina. 1. Background. 2. The grain sub-sector. 3. Policies affecting the grain sub-sector. 4. Institutions affecting the grain sub-sector. 5. Grain marketing. 6. Future directions. 7. Statistical annex, maps, bibliography.

Part II: Brazil. 8. Background. 9. The grain sub-sector 10. Policies affecting the grain sub-sector. 11. Institutions affecting the grain sub-sector. 12. Grain marketing. 13. Future directions. 14. Statistical annex, maps, bibliography.

Part III: Australia. 15. Background. 16. Grain production and marketing. 17. Public policy. 18. The Australian Wheat Board. Bibliography.

Part IV: Canada. 19. Background. 20. Grain production and marketing. 21. Programs affecting prairie agriculture. 22. Conclusions. Bibliography.

Part V: United States. 23. Social and economic environment. 24. Grain production. 25. Grain marketing. 26. Policies and group actions that affect grain markets. 27. Conclusions. Bibliography.

The "Preface" notes that grain represents the single most important component of world food consumption, accounting for about 60% of calories consumed. Total production of cereal grains (wheat, coarse grains, and rice) is about 1,890 million metric tons (mmt), of which about 12% is traded. World production of oilseeds is about 215 mmt, of which about 18% is traded. The five countries discussed in this book grow about 25% of the world's cereal grains, and they export over 60% of all the grain traded internationally. They also produce about 50% of the world's oilseeds and account for 75% of the oilseeds traded.

Several of the key issues discussed by this book include: (1) Deregulation of the grain industry in many countries. (2) How important is the effects of macroeconomic policy on grain production and marketing.

Soybeans are mentioned throughout the parts on Argentina and Brazil. The "Background" section at the start of each part gives deep insights into the policies of that part which profoundly affect its production and marketing, economics and politics of grains. Address: 1. Chief, Agriculture Div., Technical Dep., Latin America and the Caribbean Region, World Bank.

1315. Singh, Ram J.; Kollipara, Krishna Prasad; Hymowitz, Theodore. 1992. Genomic relationships among diploid wild perennial species of the genus Glycine Willd. subgenus Glycine revealed by crossability, meiotic chromosome pairing and seed protein electrophoresis. In: Theoretical and Applied Genetics. Vol. 85. 192. Berlin: Springer Verlag. See p. 276-82. Illust. 28 cm. [27 ref]*
Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1316. Wheeler, J.R. 1992. Glycine. In: J.R. Wheeler, ed. 1992. Flora of the Kimberley Region. Como, Western Australia: Western Australian Herbarium, Dep. of Conservation and Land Management. xxii + 1327 p. See p. 403-07. *

1317. Bean Supreme Ltd. 1992? Soy revolution brings happiness (Leaflet). Penrose, Auckland, New Zealand. 2 p. Undated. 28 cm.
• ***Summary:*** The front of this color, 1-page, 2-sided leaflet shows the company's vacuum packed firm tofu [launched 1984], Nine 'n' Healthy Soy Milk [launched March 1989], Tofu Luncheon [new, launched Nov. 1991], and Lite Licks frozen dessert [launched Oct. 1986]. The company describes itself as "New Zealand's own soy innovator"–a very apt description.

The back side discusses Tofu Luncheon, and gives a nutritional analysis and 2 recipes. Address: P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: 09 579 0592.

1318. **Product Name:** Tempe Indonesia (Nutrisoy).
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1993. February.
Ingredients: Soybeans, water, cider vinegar, and culture *(Rhizopus oligosporus).*
Wt/Vol., Packaging, Price: 250 gm.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Feb. 1993. Red and black on white. Front panel: "Fresh–Baru!"

1319. James, Richard F.; James, Valerie A. 1993. Deficiencies in soy-based products. In: Valerie James and Richard James. 1994. The Toxicity of Soybeans and Their Related Products. Vol. 1. Scientific Reports, Laboratory Analyses, Field Observations. Auckland, New Zealand: Published by James and James. See Section Six. 8 + 3 p. Oct. 1993, updated Dec. 1993. [5 ref]
• ***Summary:*** Contents: Introduction (includes loss of endangered indigenous species such as the kakapo and the takahe). Early investigations. The experience of others (bird owners in New Zealand). Soy bean products the common factor (in all the above deaths, diseases, sicknesses, and other problems). Wider implications (human illnesses). Conclusion.

Conclusion (Oct. 1993): "At least in the New Zealand context, processed soy products appear to cause adverse symptoms in birds similar to those expected to be associated with unprocessed soy flours. This conclusion should be viewed with alarm, as it calls into question the effectiveness of widely accepted treatment methods. Published material that indicates that soy bean isolates may contain the normal toxins of raw soy beans at even higher concentrations than in the beans because the isolation process actually concentrates them in the product is particularly alarming. This is probably the reason why the bird foods have appeared most toxic, as virtually all of them contain soy protein isolate, bought raw from the suppliers of such products and not further processed by the end user." The update states (p. 1): "Our financial losses to the end of May 1993 were in the order of $190,000, plus all the grief that accompanied them. We also have a terrible sinking feeling that the effects will be long term and irreversible." A list then gives the sad results of breeding many different bird species during the next year: Many pairs either had no young, or the young died, or the adults also died. Thus after two documented breeding seasons "Our financial losses are in the order of $350,000; because our best birds were given the 'best' food, many have died agonisingly before our eyes, and we have suffered three years of daily grief; we have sold no birds in two years and (as we are grimly determined to record future effects) we cannot honestly sell any in the foreseeable future, which we face with apprehension.

"Fortunately we have had considerable success with lories and lorikeets." Address: McLeod's Bay, RD 4, Whangarei, New Zealand. Phone: +64 9 934 0564.

1320. *SoyaScan Notes.* 1993. The world's most active countries with respect to soybeans and soyfoods, as of 1

April 1993 (Overview). April 1. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** A tally by country on the SoyaScan database (which currently contains 42,087 bibliographic references relating to soybeans and soyfoods) shows the following countries to have the largest number of listings relating to soya (over 200): United States of America 21,459, Japan 5,599 Germany 2,053 United Kingdom 1,986, China 1,844, France 1,601, India 1,222, Canada 1,112, Indonesia 993, Brazil 873, Netherlands 809, Manchuria 733, USSR 665, Italy 596, Australia 467, Korea 463, Taiwan 460, Belgium 400, Austria 375, Mexico 371, Switzerland 353, Sri Lanka 341, Philippines 323, Yugoslavia 321, Nigeria 312, Sweden 289, Argentina 244, Israel 240, Czechoslovakia 237, Denmark 225, Bulgaria 219, Malaysia 214, Thailand 214, South Africa 207, Spain 204, Russia 203.

1321. Hymowitz, Ted. 1993. First paper on hybridizing a soybean to a wild relative from Australia resulting in fertile plants (Interview). *SoyaScan Notes.* April 25. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Their former hybrids were all sterile. Now they have obtained fertile plants. Now the genes from the wild varieties are accessible for the first time to commercial soybean breeders. A lot of breeders are beginning to want the material. The most valuable character is disease resistance. For example, in all of Southeast Asia, the major soybean disease is rust. This new hybrid has moderate resistance to soybean rust. No other soybean cultivars have as much resistance to rust. The germplasm is already legally protected by the University of Illinois. Address: Prof. of Plant Genetics, Dep. of Agronomy, Univ. of Illinois, Urbana, Illinois.

1322. Rich, Robert. 1993. More on Rich Products Corporation's work with soy-based dairy analogs (Interview). *SoyaScan Notes.* July 13. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Rich Products does not have any documents in its archives on the various small companies (such as Delsoy Products) that were the first to make soy-based whip toppings starting in about 1944-45. However Bob remembers them well and what they did. Delsoy started with a filled cream named Devonshire Topping which they sold mostly in Detroit, Michigan. Then they came out with a soybean cream that was not frozen. The majority of their early sales were in the filled cream. Delsoy was never sold in Buffalo, New York, and thus was not a competitor to Rich's Whip Topping. Even after Whip Topping was frozen, Delsoy was never much of a competitor. Bob is not sure when Delsoy was launched, but he has the feeling that it was on the market only several months before his Whip Topping.

Concerning the article by F. Olmsted in the 16 April 1945 issue of the *Detroit News,* Bob (who worked for the War Food Administration or WFA) never heard of the WFA issuing an order placing a 19% limit on all fats used in any dairy product. This information was probably supplied to Olmsted by Herbert Marshall Taylor, who Bob remembers as "a wild man." Bob conjectures that maybe the reason Taylor switched to a soy-based topping was to allow him to ship the product across state lines. In those times a company could not sell a filled cream product (which was what he had) across state lines, and there were only 7 states in which filled milk products could be made and sold within the state. In fact the Milnot Company had a plant near Litchfield, Illinois, situated exactly on the state line between Illinois and Indiana. They had a filled milk processing room on each side of the line, i.e. in each state. They never made a soy-based product. At one time, Milnot started shipping its filled milk across a state line either to test the law or because they thought they could get away with it. The government seized their product and took the president to court. He was judged guilty and had to spend the weekend in jail until he could get a bail bond. He was sentenced to a year in jail but he never served time because president Franklin Roosevelt gave him a presidential pardon.

Rich Products was involved in about 40 lawsuits with various states involving its non-dairy products–and the company won them all. But if the lawsuits had taken place a few years earlier, Bob thinks Rich Products could have been beaten. The climate was changing, led by more favorable attitudes toward legalization of margarine–which replaced a dairy product. The first lawsuit against Rich Products took place in California in 1949. The charge was that Whip Topping was an imitation dairy product, and hence illegal. Arguing that the product was a replacement, not an imitation, the company won the case.

Most of the subsequent cases were against Coffee Rich (a non-dairy coffee whitener) starting in 1961. Whip Topping was not much of a threat to the dairy industry. Most milk routes used to take out 6 half pints of heavy cream (38-40% fat; housewives would use it to make whipped cream) in the morning and maybe bring back 8 in the afternoon–due to souring, etc. So heavy cream was not of much interest to milk dealers. But Coffee Rich was a real threat because much more light cream (19-20% fat; for use in coffee) and medium cream (28-30% fat; for use on cereal) was than heavy cream.

Last Wednesday (July 7) Bob celebrated his 80th birthday. He is still chairman of the board of Rich Products Corp., his son Robert Jr. is president, and Herb Kusche is executive vice president. Last year his company did $940 million is sales. Next year, which will be the company's 50th anniversary, they expect to go over $1,000 million. The company has a research department in Buffalo with 75 researchers, plus 6,000 employees and 26 plants worldwide.

They have 7 people in their London office, 5 in the Hong Kong office, 6 in Mexico City, 2 in Singapore, 2 in Brisbane (Australia), and 2 in Tokyo–all their own people.

The Freeze Flo process has become very successful, especially in frozen fruits and in their great-tasting product named Bettercreme–which was launched in April 1977 and which keeps fresh without bacterial growth or spoilage at room temperature without preservatives. It is sold as such to foodservice organizations and bakeries, which keep it frozen, then whip it for use on cakes and pies; the latter will go stale before the Better Cream! It is also used as the filling in Rich's Frozen Chocolate Eclair. Though the company spent a lot of money hoping to find medical applications for the Freeze Flo Process, nothing has yet been commercialized.

Rich Products does not have a good archives with documents from the early years of the company. "In those days we didn't save things, although we have nice displays in our memorabilia room here in our 250,000 square foot building which is called Rich Renaissance Niagara. Our offices and research center are in that building–but it houses no manufacturing operations."

Bob has heard that Edsel Ford died of either ungulate fever or cancer of the intestine. If it were ungulate fever, that could be one more reason why Henry Ford was so interested in promoting the use of soymilk–as at the Henry Ford Hospital. Bob thinks they also served a soy coffee cream (soymilk thickened with propylene glycol) at the hospital.

Note from Ford Bryan, researcher at the Ford Archives, in response to an inquiry from William Shurtleff. 1993. Aug. 9. "I'm fairly certain Henry Ford disliked cows as a boy–long before Edsel's illness. We do not seem to have a copy of Edsel Ford's death certificate. As far as we know, the cause of Edsel's death was cancer of the stomach, perhaps complicated by ungulate fever."

Talk with Herb Kusche, executive vice-president of Rich Products. 1993. July 14. "Bob Rich has a memory like an elephant; its superb." Address: Chairman of the Board, Rich Products Corp., P.O. Box 245 (1150 Niagara St.), Buffalo, New York. Phone: 716-878-8000.

1323. **Product Name:** Tofu.
Manufacturer's Name: Waiheke Tofu.
Manufacturer's Address: 31 Ostend Rd., Waiheke Island, Auckland, New Zealand. Phone: 09-372-7062.
Date of Introduction: 1993. July.
How Stored: Refrigerated.
New Product–Documentation: Talk with Carol Shortis, founder and owner of Waiheke Tofu, who calls from New Zealand. 1993. Aug. 29. She started making tofu at this company last month, July 1993. She now makes only 2 kg at a time, but she would like to expand to make 30-50 kg/day, but to continue to make her tofu by hand. Her main competitor is Bean Supreme in Auckland; they turn out large quantities of tofu at a low price. She is looking for sources of equipment.

1324. **Product Name:** Tofu Dessert [Strawberry, or Apricot].
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia.
Date of Introduction: 1993. September.
Ingredients: Strawberry: Filtered water, organic soybean, strawberry, honey, apple juice, pectin (extract of citrus peel), natural nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 200 gm cup.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in Sept. 1993. Strawberry: Green, yellow, red and blue on pink.

1325. Kirk, Bruce. 1993. Re: Feeding of birds with products containing isolated soy protein. Letter to Patricia Carr, Roudybush NZ Limited, P.O. Box 12 238, Christchurch, New Zealand, Oct. 13. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "Protein Technologies International isolated soy proteins are regarded as very high quality protein ingredients of equivalent nutritional quality to traditional high quality proteins from egg, milk, fish, and meat etc.

"Our isolates are also widely used in infant feeding programmes where lactose free products are desired. Major multinational food groups such as Wyeth, Mead-Johnson and Nutricia specify only Protein Technologies International isolates for use in their critical infant nutrition products.

"We would strongly dispute any claims that our isolated soy proteins are in any way inferior in quality to other soy protein products on the market.

"We doubt very much that the presence of isolated soy protein in your bird feed products has in any way contributed to the problems experienced by your customer." Address: Columbit [New Zealand] Ltd., Unit 3, 31 Princes St. Onehunga, P.O. Box 29-093 Greenwoods Corner, Auckland, New Zealand.

1326. Tindale, Mary D.; Craven, L.A. 1993. *Glycine pindanica* (Fabaceae: Phaseolae) a new species from West Kimberley, Western Australia. *Australian Systematic Botany* 6:371-76. Nov. 29. [12 ref]

• ***Summary:*** A new species, *Glycine pindanica* Tind. and Craven, is described from the western side of the Dampier Peninsula, Western Australia. Its distribution is mapped. Its three letter code is PIN. Illustrations show: The plant and 13 plant parts of this species. A map of Australia showing the two places the new species was found. Address: 1. National

Herbarium of New South Wales, Royal Botanic Gardens, Mrs. Macquarie's Rd., Sydney, New South Wales 2000, Australia; 2. Australian National Herbarium, Div. of Plant Industry, CSIRO, GPO Box 1600, Canberra, ACT (Australian Capital Territory) 2601, Australia.

1327. Cole, Sidney J. 1993. Changes at DE-VAU-GE (Interview). *SoyaScan Notes*. Dec. 6. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** DE-VAU-GE (DVG) has stopped making soymilk [actually they plan to stop in early 1994] and therefore also tofu. It was an economic decision. When the Adventist church sold Granose Foods in England, that cost DVG about 40-50% of their soymilk market. DVG still sells and distributes both soymilk and tofu under their GranoVita brand, but they buy the products from other manufacturers. The soymilk may be made by Alpro in Belgium. DVG still manufactures many other soyfoods, such as the soy protein foods, the canned meatlike products, etc.

DVG is still a strong company that is growing rapidly and Michael Makowski is still the general manager. He calculated that he can do better financially by using his factory space to make Corn Flakes rather than soymilk. If DVG keeps up their current growth rate, they may soon pass Australia's Sanitarium Foods as the leading Seventh-day Adventist food company in terms of sales. The church has no plans to sell DVG, and in fact the church is looking to support its food industries quite strongly now.

The decision to sell Granose was made at the local division level, not at the General Conference level. Sidney personally would have preferred that the church not sell Granose, but at least they did sell it at the right time and to a good buyer–the Haldane Foods Group. The products, the company, and the philosophy are all in good hands.

Eric Fehlberg retired about 2 years ago as director of the Seventh-day Adventist International Health Food Assoc. Dr. Cole took his place, and he has also kept his job in Miami at the Inter-American Division. Address: Director, International Health Food Assoc., P.O. Box 140760, Miami, Florida 33114-0760. Phone: 305-443-7471.

1328. Hymowitz, Ted. 1993. Re: Collecting *Glycine* species in Australia. Letter to William Shurtleff at Soyfoods Center, Dec. 7. 1 p.

• ***Summary:*** In Sept. and Oct. 1993 Ted and two colleagues from CSIRO (Tony Brown and Jim Grace) collected *Glycine* in central and north central Western Australia. The team collected 36 *Glycine* accessions from 4 species including 2 accessions of a new species, *Glycine pindanica.* Address: Prof. of Plant Genetics, Dep. of Agronomy, Univ. of Illinois, Urbana, Illinois.

1329. **Product Name:** F.G. Roberts Gluten Free Flour–Wheat Free [Plain, or Self Raising].

Manufacturer's Name: Soy Products of Australia Pty. Ltd.

Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.

Date of Introduction: 1993. December.

Ingredients: Plain: Soy flour, wholegrain brown rice flour, wholegrain maize flour, potato flour, arrowroot flour. Self Raising: The above flours plus Glucono-delta lactone, potassium bicarbonate.

Wt/Vol., Packaging, Price: 1 kg plastic bag.

How Stored: Store in a cool, dry, dark place.

New Product–Documentation: Plastic bag on which Label is printed, sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. 5.5 by 11.25 by 1.5 inches. Light blue, dark blue, and yellow on white. Illustration of F.G. Roberts (face, wearing a hat). "Naturally wholesome. Naturally from Australia."

1330. Chomchalow, Narong; Laosuwan, Paisan. eds. 1993. Soybean in Asia: Proceedings of the planning workshop for the establishment of the Asian Component of a global network on tropical and subtropical soybeans. Bangkok, Thailand: FAO Regional Office for Asia and the Pacific. viii + 218 p. Held 2-7 March 1992 at Chiang Mai, Thailand. RAPA Publication (FAO), No. 1993/6. Illust. No index. 25 cm. [76 ref]

• ***Summary:*** Preface. List of contributors. Acronyms and abbreviations. Part I–Opening session: Welcome address. Remarks. Inaugural address.

Part II–Endorsement and recommendations: Endorsement of network. General recommendation.

Part III–Country reports: Australia, Bangladesh, China, India, Indonesia, Japan, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Republic of Korea, Sri Lanka, Thailand, Vietnam.

Part IV–Institutional Parts: AVRDC, CGPRT Centre, FAO, INTSOY.

Part V–Special Reports: Oilseed crops development project, achievements on soybean research and development. The history of soybean in the Orient. Soybean processing, utilization and marketing in the Philippines. Soybean production, utilization, research and development in Taiwan. Biotechnological research on soybean at Kasetsart University. Address: 1. Regional Plant Production Officer (Industrial Crops); Both: FAO / RAPA (Regional Office for Asia and the Pacific), Bangkok, Thailand.

1331. Chomchalow, Narong; Kueneman, E.A.; Hicks, P.A. 1993. Institutional report 3–FAO. In: N. Chomchalow & P. Narong, eds. 1993. Soybean in Asia: Proceedings of the Planning Workshop for the Establishment of the Asian Component of a Global Network on Tropical and Subtropical Soybeans. Bangkok, Thailand: FAO Regional

Office for Asia and the Pacific. viii + 218 p. See p. 164-172. RAPA Publication (FAO), No. 1993/6.

• ***Summary:*** Contents: (1) Introduction. (2) FAO's involvement in soybean research and development in Asia. (3) The FAO-executed projects: National projects (Sri Lanka, Vietnam, Philippines), regional projects. (4) Other FAO-supported activities: Networking (Global Soybean Research Network, Asian Soybean Network), evaluation (Buhler's Full-fat soybean processing technology, Plenty's soymilk production in Sri Lanka, Danish Turnkey Dairies soymilk plant).

Tables: (1) Soybean production, area harvested, and yield in developing and developed countries in Asia: Developing countries: Bhutan, Cambodia, China, DPR Korea (north), India, Indonesia, Iran, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Rep. of Korea (south), Sri Lanka, Thailand, Vietnam. Developed countries: Australia, Japan, New Zealand. (2) Activities involving soybean sponsored by RAS/82/002 (1983-89). (3) Activities involving soybean sponsored by RAS/89/040 (1990-93).

Regional projects RAS/82/002: "During the period of 1983-89, an FAO-executed and UNDP-funded project, RAS/82/002, entitled "Research and development of Food Legumes and Coarse Grains {FLCG} in the Tropics and Sub-Tropics of Asia" was operated. This project involved Bangladesh, Indonesia, Lao PDR, Nepal, Pakistan, the Philippines, Republic of Korea, Sri Lanka, Thailand, and Vietnam. The project was planned in two phases; the duration of Phase I was 2 years, and activities began in September 1983. The proposed UNDP contribution for this phase was US $450,000 and the actual expenditure was US $454,394. Phase II was approved in August 1985 but implemented in July 1987 and concluded in June 1989. Total UNDP contribution for both phases was US $1,331,453.

"The long-term objective of the project was to increase production of FLCG in the participating countries in order to bridge the gap between the demand for protein-rich food for domestic needs and export markets and the actual production. One of the main goals of the project was to establish a network of national institutions, linked with international institutions capable of advancing the relevant development objective of participating countries through coordinated research and extension activities."

RAS/89/040: "A follow-up project of RAS/82/002, entitled 'Regional Cooperative Programme for the Improvement of Food Legumes and Coarse Grains in Asia', funded by UNDP, is being executed by FAO. It became operational in April 1990 and has a termination date of December 1993. Four more countries (China, India, Myanmar, and Malaysia) joined the network in this follow-up phase. The Government of Indonesia continues to provide the Secretariat."

Table 1: Bhutan: Soybean production increased from 900 tonnes (metric tons) in 1981 to 1,300 tonnes in 1991.

Cambodia: Soybean production increased from 1,100 tonnes in 1981 to 16,000 tonnes in 1991–growing at 28.0% a year on average.

North Korea: Soybean production increased from 350,000 tonnes in 1981 to 460,000 tonnes in 1991–growing at 2.5% a year.

Iran: Soybean production increased from 62,000 tonnes in 1981 to 105,000 tonnes in 1991–growing at 0.8% a year.

Laos: Soybean production increased from 3,900 tonnes in 1981 to 4,200 tonnes in 1991–growing at 1.3% a year.

Papua New Guinea: Either had no soybean production or no information was available.

New Zealand: Soybean production decreased from 300 tonnes in 1981 to 100 tonnes in 1991–decreasing at -11.0% a year. Address: 1. Regional Plant Production Officer (Industrial Crops), 2. Regional Agricultural Engineering and Agro-Industries Officer: Both: FAO/RAPA, Bangkok, Thailand; 3. Senior Officer, Plant Production and Protection Div., FAO, Rome, Italy.

1332. Lawn, Robert J.; Imrie, B.C. 1993. Country Report 1–Australia. In: N. Chomchalow & P. Narong, eds. 1993. Soybean in Asia: Proceedings of the Planning Workshop for the Establishment of the Asian Component of a Global Network on Tropical and Subtropical Soybeans. Bangkok, Thailand: FAO Regional Office for Asia and the Pacific. viii + 218 p. See p. 11-23. RAPA Publication (FAO), No. 1993/6. [36 ref]

• ***Summary:*** Content: (1) Soybean industry in Australia. (2) Soybean research and development in Australia. (3) Cultivar development. (4) Drought. (5) Improving yield potential. (6) Acknowledgements.

Figures: (1) Area, production, and average yield for soybean in Australia 1970-91. Soybean production increased from about zero in 1968 to a peak of about 130,000 metric tons in 1990. Area increased from about zero in 1968 to a peak of about 80,00 hectares in 1990. The highest yields of 1,900 kg/ha occurred in 1972 and 1982. (2) Main soybean-producing regions in Australia.

Tables: (1) Publicly-funded soybean research and development activities in Australia, contact personnel and research references. (2) Soybean cultivars available for the main soybean-growing regions in Australia. Address: Cunningham Lab., CSIRO, St. Lucia, Brisbane, Qld., Australia; Cunningham Lab, CSIRO, Canberra, Australia.

1333. Lazarides, M.; Hince, B. eds. 1993. CSIRO handbook of economic plants of Australia. Victoria, Australia: CSIRO Publications. 330 p. Illust. Index. 30 cm.

• ***Summary:*** Page 122 gives details and usually the Australian common name for the following Glycine species: (1) *G. canescens* F.J. Herm. (Silky Glycine). (2) *G.*

clandestina Wendl. (Twining Glycine). (3) *G. falcata* Benth. "Rhizomatous plant which produces seed below ground as well as in chasmogamous flowers above ground." (4) *G. latrobeana* (Meissner) Benth. (Clover Glycine). "Rhizomatous." (5) *G. max* (L.) Merr. (Soybean). "Pesticide use limits value as honey plant; cultivated only." (6) *G. soja* Siebold & Zucc. (Wild Soybean). Use: Weed. (7) *G. tabacina* (Labill.) Benth. (Glycine Pea). "Taproot has liquorice [licorice] flavour and chewed by aborigines." (8) *G. tomentella* Hayata (Woolly Glycine).

For each species, a small map shows the Australian provinces in which the species grows. Information is given on use (fodder, food), plant type (Vine or liana, herb, weed), Duration (Perennial, annual), Reference in bibliography. The following references mention Glycine species: No. 26, 36, 43, 61, 78, 81, 102, 117. Address: CSIRO Publications, 314 Albert Street, East Melbourne, Victoria, 3002, Australia. Phone: 03-418-7217.

1334. **Product Name:** Soymilk.
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kuy Street (P.O. Box 654), Mullumbimby 2484, Australia. Phone: (066) 72 5931.
Date of Introduction: 1993?
New Product–Documentation: Letter from Greg Nance-Kivell, consultant. 1993. Aug. 12. The company letterhead and business card now read: "EarthStar–Manufacturers of Quality Wholefoods, P.O. Box 654,..." They have ordered 2 copies of *Tofu & Soymilk Production, and note:* "We are a non-profit organisation with the aim of giving work opportunities to people with disabilities. We produce organic products based on soybeans, chickpeas, wheat, etc. We produce under three brands and products include tofu, soymilk, hommus [hummus], felafel, vegi sausages, and we will market soy yoghurt desserts in the future. We took over Chinese Farmhouse some 3 years ago."

1335. **Product Name:** Soya Yogurt (Cultured) [Mango, Wildberry, Apricot].
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484, Australia. Phone: (066) 72 5931.
Date of Introduction: 1994. January.
Wt/Vol., Packaging, Price: 250 gm and 500 gm plastic tubs.
How Stored: Refrigerated.
New Product–Documentation: Letter (fax) from Greg Nance-Kivell. 1996. April 2. "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse." Greg was asked to come in as a consultant in late 1991. "Soy Yoghurt (Soygurt), launched in Jan. 1994, is a fermented soymilk product, made with dairy yoghurt culture. Flavours include mango, wildberry, apricot. It is a fruit blended type and is packed in 250 gm and 500 gm plastic tubs with clip-on lids."

1336. Fitzpatrick, Mike G. 1994. Literature survey: The toxicity of soyabean and related products. In: Valerie James and Richard James. 1994. The Toxicity of Soybeans and Their Related Products. Vol. 1. Scientific Reports, Laboratory Analyses, Field Observations. Auckland, New Zealand: Published by James and James. See Section Five. 16 p. Feb. 1. [71 ref]

• ***Summary:*** Contents: Background. Scope of this report. Extract. Historical background. Soyabean toxicity: Protease inhibitors, lectins, phytate, estrogens, saponins, goitrogens, antivitamins, miscellaneous studies. Soyabean processing: Processing in the soya industry, soyflours, soy protein concentrates, soy protein isolates, recent developments in the deactivation of soya antinutritional factors, isoniazid-like compounds (perhaps niacin-like substance or niacin analogue) in soya beans. Summary and comments. Recommendations.

"As noted in part 1 of this report isoniazid is understood to have been unequivocally identified in Roudybush feed. However this laboratory suggests that the actual compound detected by others was niacin or a niacin analogue. Niacin is naturally occurring in soyabeans at a level of approximately 1.4 mg per 100 gm of raw soybeans. Niacin has also been referred to as vitamin B-3 or vitamin PP (pellagra preventing)... Hence the term niacin is also used for nicotinic acid and nicotinamide. These two compounds are structurally quite similar to isoniazid.

"We believe one of the following scenarios to be correct: (1) A niacin-like constituent of soyabeans has been incorrectly identified as isoniazid, or (2) Isoniazid has been correctly identified in the Roudybush feed and is a decomposition product of any one of a number of compounds, naturally occurring in soyabeans, that contain the 3-pyridine carboxylic acid moiety."

Note: This is the earliest document seen (Nov. 1998) that contains the word "isoniazid." The only other document is a subsequent chapter in this same report. Address: PhD, Allan Aspell and Associates, Analytical Chemists & Scientific Consultants [New Zealand].

1337. **Product Name:** Roberts Burger [Surprise, or Hot & Spicy Surprise].
Manufacturer's Name: Soy Products of Australia Pty. Ltd.
Manufacturer's Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.
Date of Introduction: 1994. February.
Ingredients: Surprise: Soy grits, potato flakes, soy flour, carrot, onion and pea powders, parsley flakes, salt, lecithin granules.

Wt/Vol., Packaging, Price: 200 gm paperboard box.
How Stored: Store in a cool, dry, dark place.
New Product–Documentation: Box with Label sent by Paul Smith of Soy Products of Australia Pty. Ltd. 1995. March 9. 4.5 by 6.75 by 1.375 inches. Blue, green, tan, and black on white. Color photo of a burger pattie topped with sliced tomatoes and cheese on a bed of lettuce between buns. "Vegetarian. Gluten & wheat free. Just add water and your imagination. Mix packet with 1.5 cups boiling water. Makes 4-8 burgers." F.G. Roberts' Burger launched Feb. 1994.

1338. Fitzpatrick, Mike G. 1994. Soybeans and their related products: An investigation into their toxic effects. In: Valerie James and Richard James. 1994. The Toxicity of Soybeans and Their Related Products. Vol. 1. Scientific Reports, Laboratory Analyses, Field Observations. Auckland, New Zealand: Published by James and James. See Section Three. 45 p. March 31. [159 ref]
• ***Summary:*** Contents: Background. Soybean Toxins: Trypsin inhibitors, lectins, phytic acid, phytoestrogens, saponins, goitrogens, miscellaneous studies. Summary. Address: Allan Aspell and Associates, Analytical Chemists & Scientific Consultants [New Zealand].

1339. Vitasoy International Holdings Ltd. 1994. New issue of 127,200,000 shares of $0.25 each at $2.28 per share: Prospectus. Hong Kong: Vitasoy International Holdings Ltd. 94 + 94 p. March 15. 28 cm. [Eng; Chi]
• ***Summary:*** This prospectus announces the first public sale of Vitasoy stock. Half the prospectus is written in English and the other half in Chinese. The sponsor and manager of this initial public stock offering is Wardley Corporate Finance Limited. Underwriters: Wardley Corporate Finance Limited, and Schroders Asia Ltd. The symbol "$" refers to Hong Kong dollars unless otherwise indicated; 7.8 Hong Kong dollars = 1 U.S. dollar, and the exchange rate is fixed.

Contents: Summary. Expected timetable. Definitions. Preliminary. Conditions of the new issue. Share capital. Indebtedness. Risk factor. Directors and corporate information. Parties involved in the new issue. Information relating to the Group: Introduction, corporate structure, history and development (see separate record), strategy, brands, market share and competition, marketing and sales, operations, tofu, Guang Ming Farm, Gardner Merchant, financial information, future plans and prospects, directors, management and staff, trademark valuation, profit and dividend forecasts, proceeds of the New Issue and working capital, adjusted net tangible assets and net assets. Appendixes: 1. Accountants' report. 2. Profit forecasts. 3. Trademark valuation. 4. Property valuation. 5. Statutory and general information. Prospectuses and application forms. Procedure for application.

Financial summary (in million Hong Kong dollars): Turnover (sales) has grown from 795 in 1991 to 912 in 1992 to 996 in 1993. Profit before taxation has grown from 43.8 in 1991 to 88.6 in 1992 to 108.8 in 1993. The company has 5 executive directors and 4 non-executive directors. All of the directors have British, Australian, U.S., or Canadian nationality. Three of the 5 executive directors are children of the founder, K.S. Lo: (1) Mr. Winston Lo Yau Lai, age 52, of Hong Kong (British nationality). Frank graduated from the University of Illinois with a BS degree in Food Science, then earned his MSc degree in Food Science from Cornell University in New York; (2) Mr. Frank Lo Yau Ki, age 54, of Hong Kong (British nationality). Frank attended Queensland Agricultural College where he obtained a diploma in dairy manufacturing before joining the group in 1965; (3) Ms. Yvonne Lo Mo-Ling, age 45, of San Francisco (California; USA nationality). Yvonne is president of the Group's operations in the USA and has been responsible for them since 1980. She received a BA degree from Oberlin College in Ohio and took undergraduate studies in Urban and Regional Planning at the University of Toronto in Canada.

Brands: Vitasoy soybean milk is the Group's principal product. Sales (in million Hong Kong dollars) were $337.4 in 1991 (42.5% of total sales), $397.0 in 1992 (43.5% of total), and $411.6 in 1993 (413% of total sales). Sales of tofu and other food products were $32.9 (US$4.21 million) in 1991, $50.2 (US$6.44) in 1992 and $50.7 (US$6.5) in 1993.

In terms of turnover (sales) by geographical area, Hong Kong is by far the leading area with 78.9% of total worldwide turnover ($995 million) in 1993, followed by North America (12.0%), Macau (2.4%), Singapore (2.2%), PRC (1.6%), Australia/New Zealand (1.6%), and others (1.1%).

Senior management includes: Mr. Jerry Maynard, age 43, who is president of Nasoya. He joined the group in 1988 and became president of Nasoya in Sept. 1993. Mr. Michael Ho, age 38, is president of Azumaya. He joined the Group in 1982 and became president of Azumaya in June 1993.

Trademark valuation: An independent valuer has valued them at HK$260 million.

Assets: The main trade marks are Vitasoy, Vita, Balanz, Azumaya, and Nasoya. Tangible: $781 million. Net assets: $1,051 million.

Subsidiaries: Value of issued and paid up share capital: Vitasoy (U.S.A.) Inc. US$12.0 million. Nasoya Foods Inc. US$6.346 million (incorporated 13 July 1990). Azumaya Inc. US$6.5 million (incorporated 1 July 1969).

Properties: The main property, located at No. 1 Kin Wong St., Tuen Muen, New Territories, has a capital value of HK$140 million on 28 Feb. 1994. This is a 17-story industrial building, completed in 1986, on a site of 33,250 square feet (3.089 square miles). It has a total gross floor area of approximately 311,815 square feet, including 38 lorry parking spaces and 22 private parking spaces. The property is held from the Government under New Grant No. 2606 for a term extending to 2047. The current ground rent is $600 per annum. The Azumaya rental property comprises 37,172 square feet of interior floor space on 2 acres of land. Monthly rental is about $20,000. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1340. Vitasoy International Holdings Ltd. 1994. History and development (Document part). In: New issue of 127,200,000 shares of $0.25 each at $2.28 per share: Prospectus. 1994. Hong Kong: Vitasoy. 94 + 94 p. See p. 14-15. March 15. 28 cm. [Eng; Chi]

• ***Summary:*** The Company, originally named Hong Kong Soya Bean Products Company Ltd. was founded in March 1940 by four men, Mr. (later Dr.) Lo Kwee Seong, Mr. Shiu Wai-Ming, Mr. Chan Nam-Cheong, and Mr. Kwan Yim-Chor. The Company's first product, named Vitamilk, was first sold in Hong Kong just prior to the outbreak of World War II. Note: Production began on 9 March 1940. Vitamilk was fortified with calcium, cod-liver oil, and vitamins, and sold in small milk bottles. Production of Vitamilk ceased during the War, but after the War the Company relaunched Vitamilk, which was then produced at and sold from, small premises in Causeway Bay. 1950–The Company moved to new premises in Aberdeen to keep up with growing sales; it now had increased production capacity and facilities for research and development. At the same time the Company became the franchisee for Green Spot, an orange flavoured soft drink. Green Spot proved highly popular in Hong Kong and provided the company with the opportunity to gain important experience in pasteurization and sterilization techniques. 1953–This new expertise led to the Company's development of a sterilized version of Vitamilk, which had a longer shelf life. At the same time the product was renamed Vitasoy in English and repackaged in narrow-necked soft drink bottles, which replaced the traditional milk bottles. Note: In 1953 the company first began to work with UNICEF to popularize the use of soy beverages in developing countries. 1957–The Pepsi-Cola franchise replaced the Green Spot franchise.

1960–The image of Vitasoy as a nutritious quality product received a boost when UNICEF became aware of the attractions of a high protein, vitamin enriched soybean milk for use in developing countries. 1961–An additional soymilk production plant was opened in Kwun Tong to keep up with rapid increases in sales of Vitasoy. 1962–The introduction of a malt Vitasoy helped lead to further increases in sales. From 1955 to 1970 sales of Vitasoy grew from approximately 12 million bottles to approximately 60 million bottles per annum.

1970s–The Company continued to expand and develop. 1975–A major development was the adoption of a new Tetra Pak packaging process, which brought many benefits. "In addition to enhancing the quality of the product, the new light and disposable packaging meant that Vitasoy could be sold in the non-returnable soft drinks market which significantly reduced both the delivery costs of the product and the costs associated with collecting returned bottles. The new packaging also offered greater scope for innovative design which assisted in marketing the Company's products. To coincide with this technical innovation, in the mid-1970s the Company repositioned Vitasoy in the market by promoting it as a soft drink as well as a milk substitute. The remainder of the 1970s saw the Company's product base expand away from Vitasoy and malt Vitasoy.

1976–A range of fruit juice drinks was introduced under the vita brand name. These were also packaged in Tetra Pak cartons and initial flavors included orange, lime, mango, and guava. 1976–The Company decided to relinquish the Pepsi-Cola franchise in favor of producing its own range of carbonated drinks, again under the Vita brand name. The carbonated products, which included cola, orange, lemon lime, and cream soda, were initially sold in returnable bottles and subsequently also in the form of fountain syrups. Both Vita Juice drinks and Vita carbonated drinks won immediate consumer acceptance upon their introduction. 1977–Exports to Australia began. 1978–Vita Juice drinks now have over 30% of the Hong Kong fruit juice drinks market. 1978–The Company moved its Aberdeen production facilities to Heung Yip Road in Aberdeen. 1978–The Company launched a line of traditional teas, the first of which was chrysanthemum, which were sold under the Vita brand and packaged in Tetra Pak cartons.

1979–The Company began a further significant diversification of its business by entering into an agreement with Guang Ming Farm [at Shenzhen, just inside China]. Under the initial agreement, which was for a term of 5 years, and subsequent revisions to this agreement, the Company obtained the rights to market and sell most of the farm's fresh milk output in Hong Kong and Macau. Today the farm produces approximately 55% of all fresh milk sold in Hong Kong.

The late 1970s and early 1980s were characterized by the Company's push into overseas export markets. Each of these export markets took time to develop, both in terms of developing consumer awareness of the Vitasoy and Vita products and particularly in identifying the most suitable and effective distribution channels. 1979–Exports to Papua New Guinea and to Canada began. 1979 Jan. 15–Vitasoy (U.S.A.) Inc. is incorporated.

1980–Exports to the United States began. 1982–In the United States, the Company established its own distribution operations. 1982–Exports to Singapore began. 1985–The Company acquired the operations of its Singapore distributor to gain greater control over and more efficient distribution of its products. 1987–Due to growth of operations, the Company opened a new head office and principal manufacturing facility in Tuen Mun. 1989–The Company acquired a 12% equity stake in its contract packer in Papua New Guinea to gain greater control over and more efficient distribution of its products.

1990 Sept. 24–The Company name is changed to Vitasoy International Holdings Ltd. from Hong Kong Soya Bean Products Co. Ltd. 1990–The Group made the first of two significant diversifications from its traditional business by entering into a joint venture with Gardner Merchant to provide large-scale contract catering services in Hong Kong. Gardner Merchant, headquartered in the United Kingdom, is one of the leading contract catering firms in the UK; the Group has a 40% interest in the joint venture.

1990 Aug.–In its second diversification the Group entered into the manufacture and distribution of tofu in the United States through the purchase of Nasoya, based in Leominster, Massachusetts on the east coast of the United States. 1993 May–The Group acquired Azumaya, a large tofu manufacturer based in San Francisco, California, with a distribution network covering the west coast and mid west of the United States. These acquisitions have not only made the group a [sic, the] leading manufacturer and distributor of tofu in the United States but have also provided the Group with an extensive distribution network throughout the United States and Canada for its other products. 1992–Distilled water was launched under the Vita brand.

1994 Feb.–The Group opened a new production facility on a site at Guang Ming Farm at Shenzhen in the PRC [China] to replace the group's plant in Aberdeen. The Shenzhen plant, which has been built and will be operated pursuant to a joint venture with Guang Ming Farm, is currently operating at partial capacity and is expected to be fully operational by the middle of 1994. The Group's old production and packaging facility at Aberdeen is currently being leased by the Group to provide production capacity unti the Shenzhen plant becomes fully operational. At that time the Group will cease to lease the facility at Aberdeen and all beverage production will then be at Tuen Mun and Shenzhen. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1341. James, Valerie; James, Richard. 1994. The toxicity of soybeans and their related products. Vol. 1. Scientific reports, laboratory analyses, field observations. Auckland, New Zealand: Published by James and James. 91 leaves 30 cm.
• ***Summary:*** Contents: 1. Introduction, by V.A. James, R.F. James. 2. Introductory essay, by D.J. Woodhams (dated 11 April 1994). 3. Soybeans and related products, by Allan Aspell and Associates (dated 31 March 1994). 4. Laboratory analysis: Determination of isoflavonoids in various samples–genistein/genistin and daidzein/daidzin, determination of genistein in various samples, determination of trypsin inhibitor content of various soy products. 5. Literature survey: The toxicity of soybean and related products, by Dr. M.G. Fitzpatrick (dated 1 Feb. 1994). 6. Deficiencies in soy based products, by V.A. and R.F. James (31 Dec. 1993).

A note at the bottom of the title page states: "This is volume one of six. Volumes 2, 3, 4, and 5 comprise 243 items of previously published literature. Volume 6 contains chemical structures, history, correspondence, and an avicultural supplement."

Note: This is the report that started the recent concerns about the toxicity of soybeans–especially in New Zealand. The title page states: Prepared by: Dr. M.G. Fitzpatrick, Allan Aspell and Associates, Analytical Chemists & Scientific Consultants. Prepared for: Mr. R.F. James, Whangarei Heads Rd., RD 4, Whangarei [New Zealand]. Project number: 7435. Date: 1 Feb. 1994.

This report was a result of an incident: Mr. Richard James, a parrot breeder in New Zealand, claims that his parrots died as a result of consuming soybean meal. Mr. James hired a toxicologist and private consultant, Dr. M.G. Fitzpatrick, to conduct a literature search on components in soybeans that might be related to the death of his parrots. Soybeans have long been known to contain a number of biologically active antinutritional factors, but these have long since ceased to be of concern to most scientists. In fact, in recent years, many of these biologically factors (such as isoflavones, trypsin inhibitors, and phytic acid) are being studied for their anticancer activities.

Update: April 1995. Mr. James and the company selling the animal feed containing soybean meal are presently suing one another. Mr. James reportedly has spent $350,000 of his own funds in an effort to warn people about the dangers of soya. It is clear from personal communications that he regards this as his personal mission. Address: Whangarei, New Zealand. Phone: +64 9 434 0564.

1342. Woodhams, Dr. David J. 1994. Introductory essay: The toxicity of soybeans and related products. In: Valerie James and Richard James. 1994. The Toxicity of Soybeans and Their Related Products. Vol. 1. Scientific Reports, Laboratory Analyses, Field Observations. Auckland, New Zealand: Published by James and James. See Section Two. 9 p. April 11. [9 ref]
• ***Summary:*** Contents: Background. Soy protein based infant formulas. Traditional use. Conclusions.

Note: This was published as a separate booklet on 5 March 1995 by the Soy Information Network (SIN; Whangarei, New Zealand). Address: PhD, CEng, MIChemE, MIPENZ, MNZIC, Dairy Process Consultant, 2/47 Church St., Devonport 1309, New Zealand.

1343. Bean Supreme Ltd. 1994. Wholesale price list. P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. 2 p. May 1. 28 cm.
• ***Summary:*** The company sells the following soyfoods: Tofu (firm bulk and vacuum pack), Tofu Luncheon (3 flavors), Soysage, Tempeh (vacuum pack), Soymilk (Nice 'n' Healthy), Lite Licks Non-Dairy Frozen Dessert (6 flavors in 2 liter size, 3 of those flavors in 475 ml size, and bulk packs of 9 liters and 16 liters).

It also sells the following non-soy foods: Biofarm organic yoghurts (3 flavors), Malabar goat yoghurt, Cyclops acidophilus yoghurt (5 flavors), Koromiko cheeses (10 flavors), Olive grove Middle Eastern foods (falafel mix, hoummus, Middle Eastern sauce, tahini), herbal teas (3 flavors), and Pacific Harvest sea vegetables (Karengo fronds, flakes, and shaker, and kelp shaker). Address: Penrose, Auckland, New Zealand.

1344. Kollipara, Krishna P.; Singh, R.J.; Hymowitz, T. 1994. Genomic diversity and multiple origins of tetraploid (2n = 78, 80) *Glycine tomentella. Genome* 37(3):448-59. June. [41 ref]
• ***Summary:*** Among the 15 wild perennial species of the genus *Glycine* Willd. subgenus *Glycine, Glycine tomentella* is exceptional. It is composed of four cytotypes (2n = 38, 40, 78, 80), is diverse in morphological features, and covers a wide geographical area. "The aneudiploid (2n = 38) is restricted in distribution to Australia. Diploid (2n = 40) and aneutetraploid (2n = 78) cytotypes are found in Australia and Papua New Guinea, whereas the tetraploid (2n = 80) cytotype is distributed in Australia, Papua New Guinea, Philippines, Indonesia, and Taiwan." Address: Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1345. **Product Name:** Tempeh.
Manufacturer's Name: Stanley Darby.
Manufacturer's Address: P.O. Box 7248, Agat, Guam 96928. Phone: 671 565-2059.
Date of Introduction: 1994. June.
New Product–Documentation: Talk with Stanley Darby of Guam. 1995. June 14. He is a Seventh-day Adventist, who has been making tempeh by hand for about one year and selling it to Seventh-day Adventists who have a large get-together each Saturday after church. He has brought tempeh starter culture back from Indonesia several times.

Stanley calls again from Guam. His address is now P.O. Box 8389. He still makes tempeh for SDAs and still has no company name.

1346. Johnston, Trevor. 1994. Re: Recent developments at Bean Supreme Ltd. in New Zealand. Questions answered on Soyfoods Center letterhead (dated 27 June 1994) and returned to SC on 8 July 1994. 2 p. Plus handwritten note with signature on letterhead.
• ***Summary:*** In April 1989, in order to expand operations, the company moved to its present address in Penrose from its former location at 1 Wallingford St., Grey Lynn, Auckland. In about Feb. 1990 the company changed its name to Down to Earth Natural Products Ltd. in order to try to reposition away from a specialty soy identity. However a major household cleaner company in New Zealand launched a product with the same name, "Down to Earth," so Trevor had to change the company name back to the original name. But at the same time the company redeveloped its logos and the corporate identity.

Presently, the company's best-selling soyfood products are Nice 'n' Healthy (isolated-based soymilk, launched in March 1989), and Lite Licks Dessert (soy ice cream, launched in Oct. 1986).

The company's brands also include Bio Farm, and Spiral Foods. Address: Managing Director, Bean Supreme Ltd., P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: (09) 590 592.

1347. **Product Name:** Soyco Tofu [Hi-Protein Firm, Tasty, Thai, Japanese].
Manufacturer's Name: Soyco Soyfood Product [Nutrisoy Pty. Ltd.].
Manufacturer's Address: 255 Forest Road, Arncliffe 2205, NSW, Australia. Phone: 02-9695-7755.
Date of Introduction: 1994. July.
Ingredients: Thai: Organic soybean, water, soy sauce, sunflower oil, spices, herbs, natural coagulant (magnesium chloride).
Wt/Vol., Packaging, Price: 200 gm.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in July 1994. Thai: Green, orange, yellow, red and black on pale white.

1348. Snyder, Murray. 1994. Tofu cheesecake, Marcea Newman Weber, and macrobiotics (Interview). *SoyaScan Notes.* Sept. 19. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Murray remembers that Sprucetree Baking Co. made a tofu cheesecake, but he does recall being the source of the recipe. He was the originator of the Sweet Rice Cookie–which Sprucetree also made. When Murray thinks of that cheesecake, he thinks of Marcea Newman (who was married to Dan Weber in December 1982 in Australia, so her name is now Marcea Weber. She and Dan and her children live in Faulconbridge, NSW, Australia). Marcea is a native of New York, but in about 1969-1970 she went to California to study macrobiotics (perhaps with Herman or

Cornellia Aihara); she ended up at a macrobiotic study house in San Francisco run by Nan and Dave Schleiger. Murray first met Marcea in California, then she returned to New York.

Murray arrived in Boston on Valentine's day in Feb. 1971. He stayed there studying macrobiotics until Oct. 1972. A little later in 1971 Marcea Newman moved to Boston from New York. He and Marcea got their own apartment and lived together in Boston during 1971 and 1972. At this time Marcea was baking (very carefully testing and converting old family recipes to macrobiotics; her mother was an excellent baker) and she taught Murray how to bake. At the time she did not sell her baked goods. It was from some recipes that she gave Murray that he evolved into the Sweet Rice Cookie, the Babka, etc. Using recipes given or taught to him by Marcea, Murray rented out the kitchen in the Erewhon warehouse and started to do some baking.

In 1974 Marcea's pioneering book titled *The sweet life: Marcea Newman's natural-food dessert book* was published. It contains a recipe for "Cheesecake Tofu Pie" (p. 37), as well as many other innovative desserts and dairylike products that use tofu as a major ingredient. "Marcea was the person who developed the Tofu Cheesecake that Souen, a macrobiotic restaurant in New York City, eventually made and sold. She was very friendly with them and she lived nearby in New York. She also knew the people at The Caldron restaurant."

Murray still has a book of large-scale recipes for baked goods that he made at Erewhon from 1971 and later gave to Howard Grundland. It contains recipes for Sweet rice cookies, Dried fruit square, Babka peanut square, Chestnut bar, Kanten cake, Apple crunch, Apple-tahini juice pie, Rice bread. There are no tofu recipes in that book.

Murray can think of only two ways that he could have been the source of the recipe for tofu pie [cheesecake] made by Sprucetree starting in 1975 or 1976: (1) He suggested that Howard Grundland use the recipe in Marcea Newman's book *The Sweet Life;* (2) He brought Howard a tofu cheesecake made in New York City by either The Caldron or Souen; (3) He could have learned the recipe from his ex-wife, Pam. Note: For more on America's first tofu cheesecake see letter from Marcea Newman Weber, Oct. 1994.

People that Murray remembers living in Boston during 1971 and 1972 were Michael Rosoff, Lenny Jacobs, Jim Ledbetter, Eric Utne and his brother (Tom?), Phil Levy, Paul Hawken, Bruce Gardner, Tom Hatch, and Matt Chait. Matt Chait used the Erewhon kitchen before Murray began baking there. Matt developed the Ricycle, which were bikes with food trays that went out to the colleges. Tony Harnett also worked in that kitchen; he went on to do Bread and Circus. Matt and Murray created Macrojacks–the original caramelized popcorn with barley malt, raisins, and peanuts "which is now made by 2-3 other companies and sold all over the place." In late 1971 or early 1972 they had purchased their heat sealer, boxes, and labels, and they began to make and sell Macrojacks–fairly large quantities. They were all ready to make this into a big business, but circumstances prevented that from happening.

Murray was in Brazil from Oct. 1972 to April 1973. He returned to Baltimore, Maryland, and in 1973-75 he probably made trips up to New York. When he thinks of early tofu desserts, he thinks of the cheesecakes made at Souen (in New York City; it was started and owned by Yama, a Japanese man) and The Caldron (in New York City; it was originally owned by a man named Marty Schloss, plus his wife, Glory, and mother [Seena], who were a good friend of Marcea's). The Caldron had an extensive baking operation, and they may have made a tofu cheesecake even before Souen. Whenever Murray went to New York he would always go to The Caldron to see what innovative new products they had, and he would always bring a number of items back to Baltimore for people to taste test. Marcea would probably remember if The Caldron was known for making a cheesecake, and when and where they got the idea and recipe.

Murray agrees that a remarkably large percentage of macrobiotic students and teachers in the early days were Jewish. He would guess that in 1971-72 roughly 30-35% of the macrobiotic students in Boston were Jewish. "One reason is that many Jewish people of that era were seekers. They were looking for answers; they wanted to know what life was all about and how they could help society. There were unexplained things that were not being talked about in their religion, culture, schools, etc. Historically, there is a strong thread of humanistic ideals within the Jewish culture.

The macrobiotic movement, as he used to know it, is presently very stagnant. Many old problems have never been resolved. Not everybody wanted to follow a strict, Japanese model–and rightly so. "But I think more people are eating what we would consider to be macrobiotic-type food and loosely following what we consider to be a macrobiotic diet. There is definitely a lot of literature and books being sold under the guise of macrobiotic education. Somewhere down the line, macrobiotics may even become invisible because the basic tenets are going to be integrated a lot of educational and wholistic teachings." Murray is a macrobiotic counselor and teacher, but he is "trying to offer a much broader, more flexible, more embracing way to present macrobiotics without creating a dogma."

Note: Call from Howard Grundland. 1998. Aug. 31. Murray Snyder died recently of throat cancer. Address: Macrobiotic Holistic Health Care, 157 East 61st St., 5th Floor, New York, NY 10021. Phone: 212-308-3818.

1349. Weber, Marcea Newman. 1994. Re: History of early work with tofu and tofu cheesecakes in America. Letter to

William Shurtleff at Soyfoods Center, Oct. 4–in reply to inquiry. 3 p. Typed, with signature.

• ***Summary:*** Marcea was first introduced to tofu in New York City in the late 1960s or early 1970s. She was living on West 72nd St. and was baking cakes, cookies, and slices for some of the health food shops and restaurants in New York City. "One day I happened to venture across a tofu factory that was located in a shop front on Amsterdam Avenue between 74th and 75th St. in Manhattan. [Note: This was K. Tanaka & Co., 326 Amsterdam Ave. Owner: Mr. Eisuke Murakami.] I went in to get a closer look at what they were doing and asked if I could stay and watch. They asked me to come back the next day as they were finishing their work for the day. So the next day I arrived there not knowing what on earth was in store for me, but the feeling to seek out this procedure was quite clear inside of me. They gave me some black rubber boots to wear as there was water everywhere and invited me in to watch the whole operation. It was very primitive according to today's standards. Everything was done by hand, from the grinding to the cooking and pressing, nevertheless I went through the whole tofu operation from start to finish. Being my first experience watching tofu being made, I didn't know anything else to compare it to.

"Then as I inspected it more closely, I began to think of cheese and as I was not eating dairy foods any longer perhaps the desire to eat some cheese affected the way I perceived it and so I took some home and thought I would like to experiment with it. I started to bake a 'cheesecake' with it although at the time I was just putting together ingredients. You see I had never baked a cheesecake in my life and for that matter most of what I did I did without having to experiment at all. The first time I put different ingredients together something delicious came out of the oven.

"The cheesecake worked and from then on I started to experiment with different flavours and toppings and then started to ask some of the natural food restaurants of they wanted to buy some 'Tofu Cheesecake' or 'Tofu Cream Pie' (I don't really remember which name I preferred). I don't really know where the inspiration came from and what it was all about. I was, after all, baking for some of the health food stores already, making things like O'george bars, which were peanut and raisin and honey bars, and selling them and cookies and other slices as well on a pushcart which I operated on the weekends."

What was the inspiration that led Marcea to develop so many remarkable tofu recipes in *The Sweet Life* (1974)? "I feel that my mother's influence had a great deal to do with it, although she did not bake cheesecakes, but I feel that the recipes kept coming through me, and I don't really understand how except I felt like a medium at times who was doing it without thought. My mother was a very good baker, although most of her baking took the form of honey cakes, cookies, and apple pies. I did spend many long hours watching her bake many kinds of delicious Jewish pastries and helped her lick the bowl clean.

"I began supplying fruit cakes to Souen [a restaurant at 2444 Broadway, between 90th and 91st Street, in New York City] when they first opened and as I knew the owners they asked me to help in the sweets department. In 1971, as soon as I perfected the 'Tofu Cheesecake' or 'Tofu Cream Pie' I began to sell it at the restaurant. As far as I know, this was the first product of its type sold in the U.S. I lived on West 72nd Street, near the restaurant, and I did spend lots of time there developing recipes and helping out." Note that Marcea developed this tofu cheesecake three years before her book *The Sweet Life* was published.

"The Cauldron [sic, Caldron] (a restaurant started by Marty and Glory Schloss and his mother) also had a [non-dairy] cheesecake, which I think had tofu as a major ingredient and which was slightly different than mine. I remember trying to figure out how they made theirs but of course it was a trade secret. I'm not sure when their cheesecake was introduced. I remember seeing it either after I developed mine, or at about the same time." Marcea also sold her tofu cheesecakes at Erewhon. She was not aware that Kathy Bellicchi ever made a tofu cheesecake. She does not remember the names of the first owners of Souen.

Marcea moved to Boston, Massachusetts, in about mid-1971. Other people in Boston at the time were Bill Tara, Paul Hawken, Dora Hawken, Murray Snyder, Daniel Weber, and Rebecca Wood.

Marcea and Daniel Weber met in Boston in about 1972, and both studied macrobiotics. They left Boston in 1974 to live in England because Daniel wanted to study acupuncture there. Address: 56 St. Georges Cres., Faulconbridge 2776 NSW, Australia.

1350. Oerke, E.C.; Dehne, H.W.; Schoenbeck, F.; Weber, A. 1994. Crop production and crop protection. New York, NY, and Amsterdam: Elsevier Science. 830 p. *

• ***Summary:*** One section, titled "Estimated crop losses in soybeans," discusses: Cultivation, production and crop protection. Crop losses in Africa. Crop losses in America. Crop losses in Asia. Crop losses in Europe and the USSR. Crop losses in Oceana. Overall summary of losses in soybean production.

1351. *Daily Post (Rotorua, New Zealand).* 1994. Fears prompt probe of baby formula. Dec. 8.

• ***Summary:*** "The Ministry of Health is to investigate the safety of soy-based infant formulas." Variations on this article appeared on this date in Australia in the *Northern Advocate, Nelson Evening Mail, Evening Standard,* and *Waikato Times.*

1352. *New Zealand Herald.* 1994. Govt. checks soya milk. Dec. 8.

• ***Summary:*** The Wellington staff reports that the Ministry of Health is investigating a report on the effects of soya-bean based infant milk. "The Minister of Health, Mrs. [Jenny] Shipley, told Parliament yesterday that the ministry had received a report on the matter from the Auckland School of Medicine by a senior lecturer in toxicology, Dr. Iain Robertson. The report recommends that the use of soya-bean products in infant milk formula be stopped because of the high level of oestrogenic compounds found in the four major brands on sale in New Zealand.

"Mrs. Shipley was responding to a question from the Alliance leader, Sandra Lee, who tabled a letter to the ministry from a Devonport process engineering consultant, Dr. David Woodhams. Dr. Woodhams described himself as a member of a privately funded group which has been looking into the scientific literature on soya beans and soya-bean products and their effects on humans. 'I imagine that few mothers would choose to feed a formula containing both active oestrogens and an immune suppressant to their baby during the first few months of life if they had an informed choice,' he said. Mrs. Shipley said the ministry was investigating to see whether the claims could be substantiated. At this stage, there was insufficient evidence to withdraw the products." Address: Wellington staff.

1353. New Zealand Ministry of Health. 1994. Director General's privileged statement under Section 37 of the Food Act 1981 (News release). 13 Molsworth St., P.O. Box 3013, Wellington, New Zealand. 1 p. Dec. 8. [1 ref]

• ***Summary:*** "Acting Director-General of Health David Smyth says the Ministry of Health has no knowledge of any reputable scientific studies that suggest soy based milk formulas are detrimental to baby's health. 'Babies who are being fed soy based milk formula on the advice of their health specialist should continue being fed with this product,' says Mr. Smyth.

"The Ministry is, however, investigating the claim that soy based milk formulas have adverse health affects. The claim was made in an independent report prepared and released by Mr. and Mrs. James in Whangarei."

"The soy based milk formulas, which are produced and sold by international companies all around the world, have been in New Zealand for approximately 20 years and in the United States for 30 years. Parents who have any queries about their baby's diet should ring The Royal New Zealand Plunket Society's free phone 0800 101067 for more information.

"Signed by Acting Director-General of Health, David Smyth." Address: Wellington, New Zealand. Phone: (04) 496 2000.

1354. Roberts, Rosemary. 1994. Grotesque deaths transform bird hobby to heartbreak: Soybean investigation sparks infant food safety scare. *Northern Advocate (Whangarei, New Zealand).* Dec. 8. p. 2.

• ***Summary:*** "Richard and Valerie James' retirement home at Whangarei Heads turned from heaven into Heartbreak House about 3 years ago when many of their parrots began dying inexplicably.

"Their efforts to work out what had happened to their birds led them to make inquiries all over the world and spend well over $100,000 on research and information.

"Some of this research has resulted in the story published in today's *Northern Advocate* on soy-based infant formulas. The Auckland Medical School's chief toxicologist, Dr Iain Robertson, has called for use of soy-based infant formulas to be discontinued until more research has been done into their levels of phyto (plant) oestrogens.

"Richard and Valerie James are New Zealanders who lived and worked overseas for 19 years in law, education and real estate. They returned to New Zealand in 1984 and retired to Whangarei Heads about five years ago."

"The birds began to die when the couple started using commercially-prepared handrearing baby bird food, about four years ago.

"'Initially they grew brilliantly. Then they died,' says Valerie James.

"Others were born deformed. The breeding birds laid malformed eggs. Some also suffered convulsions, behaved strangely, and frequently haemorrhaged violently before dying."

"Early in 1993 the Jameses had immediate autopsies on a few young parrots done at several laboratories, including the Massey University School of Veterinary Pathology.

"The full autopsy report suggested the underlying cause of death was severe depression of the birds' immune systems. The James' were told previous autopsies on other birds of different origin but fed similar food had also revealed this feature.

"Extremely concerned at the implications of what little they knew at the time, the couple commissioned tests at laboratories in New Zealand and the United States.

"The mystery started to unravel for the couple when they realised two things. One was that the base for most anti-coagulant rat poison was originally synthesised from a naturally occurring plant toxin with oestrogenic properties. The other was that the soybean was high in plant oestrogens."

Photos show: (1) Valerie and Richard James (portraits, p. 2); (2) Valerie and Richard, each with a cockatiel on the shoulder, by their outdoors bird cages, with their report, books, and a dish of dry soy bird food (p. 1).

This article (slightly changed) also appeared in New Zealand on this same date in the *Marlborough Express* under the title "Couple spends fortune on feathered friends' deaths: Richard and Valerie James didn't realise what they were getting into when they began investigating the inexplicable deaths of their parrots."

1355. Roberts, Rosemary. 1994. Vet: Couple may have solved poison problem. *Northern Advocate (Whangarei, New Zealand).* Dec. 8. p. 2.

• ***Summary:*** "Veterinarians and owners have been puzzling over the sudden deaths of several birds and animals for several years," according to Whangarei veterinary surgeon Bruce Pickford. It is very strange that they have been suffering internal haemmoraging and autopsies have shown their livers have turned to pulp. Since the word got out that the soybean content of some feeds may be responsible, and he has been warning people to be careful, the number of cases has decreased during the past six months. Mr. Pickford came to believe the problem had to be hormone related because birds were maturing much earlier than is normal. Laboratories that were sent specimens of dead birds made a tentative diagnosis of the poison wolferin [sic, warfarin], whose composition is similar to that of oestrogen. But then the question was: How did birds in cages get access to this poison. Pickford believes that Richard and Valerie James may have found the answer–that the oestrogens come from the soy content of commercial bird feeds. "But naturally everyone is ducking for cover because the ramifications are incredible."

"Footnote: Wolferin, the base for most anti-coagulant rat poisons [rodenticides], was originally synthesized from a naturally-occurring plant toxin which has oestrogenic properties." A photo shows veterinarian, Bruce Pickford.

1356. Roberts, Rosemary. 1994. Infant food safety queried. Ministry will investigate. *Northern Advocate (Whangarei, New Zealand).* Dec. 8. p. 1.

• ***Summary:*** "Infants on a soy-based diet might be consuming up to 12 contraceptive pill equivalents per day," according to Auckland research scientist Mike Fitzpatrick. Auckland Medical School senior toxicologist Iain Robertson says that the use of soybean-based infant formulas should be discontinued pending further research on possible side-effects on babies. Four soy-based infant formulas are currently on sale in new Zealand–Prosobee, Isomil, Karicare, and Infasoy. Robertson said new research has showed that soy-based infant products have high levels of phyto-oestrogens (plant oestrogens) and researchers have little knowledge of the effects of these compounds on babies.

His recommendation to discontinue the use of such soy-based infant products is contained in a review of a scientific study commissioned by Richard and Valerie James of Whangarei, New Zealand. Mr. and Mrs. James commissioned the investigation by Mike Fitzpatrick, PhD, after the unusual and painful deaths of many of their newly-hatched parrot chicks, and the often premature maturing of the few survivors. These parrots were reared solely on a commercial soy-based bird food. The New Zealand Ministry of Health also plans to investigate the safety of the soy-based infant formulas. The Ministry's chief toxicologist Martin Edwards said he had received a copy of the Fitzpatrick report and was taking its recommendations seriously. He said the ministry would consult organisations such as the Pediatricians Society and the Plunket Society.

Similar articles appeared in 3-4 New Zealand newspapers on this same day, including the *Marlborough Express* and *Gisborne Herald.*

1357. Roberts, Rosemary. 1994. Maker welcomes call for research [into safety of soy-based infant food]. *Northern Advocate (Whangarei, New Zealand).* Dec. 8. p. 1.

• ***Summary:*** Douglas Pharmaceuticals produces Karicare brand soy-based infant formula; according Dr. John Birbeck, the company's private consultant, Douglas is the only New Zealand company making such a product. He believes other similar foods are being imported. Birbeck says the company welcomes more research on the oestrogen content of its soy-based product, and says it is likely the industry will fund the study.

Columbit New Zealand, the company which imports soy isolates to New Zealand, also backs the call for more research, and is confident research will clear its product. Columbit is a partner of the large international corporation Protein Technologies [International]; principals of that U.S.-based company said that they would respond to any requests for information about their products.

Sanitarium Foods [of New Zealand and Australia] does not produce soy-based infant formulae, but does use soy protein isolates in some of its products. The company's technology superintendent, Graham Jackson, said his company was keeping an eye on the situation.

A large photo shows Valerie and Richard James at their New Zealand aviary, with several large white birds, soy bird food, and reports on soy. A similar article appeared in the *Marlborough Express* on this same day.

1358. Royal New Zealand Plunket Society. 1994. Formula 1 [Statement on the safety of soy-based infant formulas] (News release). New Zealand. 1 p. Dec. 8.

• ***Summary:*** "The Plunket Society says there is no evidence that soy-based infant formula is dangerous to babies' health–and parents should not be anxious about using the product. Concerns have been raised over the safety of soy-based formulas, after research found they contained a plant-based substance similar to the hormone oestrogen. Plunket says that further research and observation is planned, but there is no reason for undue concern over the products.

"Plunket paediatrician Dr. Charles Essex says that soy formula has been used internationally for many decades and in New Zealand for more than 10 years, with no reports of adverse effects. In New Zealand, soy formulas account for about 13 per cent of all [infant] formula sales. 'Millions of babies have been fed soy formula,' Dr. Essex says, 'and one would have imagined any serious side effects would have shown up by now.'

"Dr. Essex says that soy contains a compound which is chemically similar to oestrogen. However even breastfed infants can often exhibit oestrogen effects, from maternal oestrogen. These are quite normal, and can include small breast buds for up to six months after birth, secretion of small amounts of breast milk, and a little vaginal bleeding, like a mini-period. 'Infants under one year of age, for their main milk drink, should ideally be breastfed,' Dr. Essex says. Otherwise they should be fed a recognized infant formula, either cow's milk-based or soy-based.'" Address: New Zealand.

1359. NZPA. 1994. Ministry queries soy formula risk. *New Zealand Herald*. Dec. 9.
• ***Summary:*** "The Ministry of Health and the Plunket Society have moved to allay fears that soya-based milk formulas could be harmful to babies. Both said they were unaware of any reputable studies showing soy-based milk products could have adverse health effects.

"Concerns have been raised over the safety of soy products after research found they contained a plant-based compound which is chemically similar to the hormone oestrogen.

"The Acting Director General of Health, Mr. David Smyth, said parents who were feeding babies with soy-based milk on the advice of a doctor should continue doing so. However the ministry was investigating a claim that soy-based formulas might have general adverse health effects."

"A Plunket paediatrician, Dr. Charles Essex, said further research was planned, but there was no reason for undue concern about the products. In New Zealand soy formulas account for 13 per cent of all formula sales."

"Infants who have a definite cow's milk allergy should use a hydrolysed formula, and there are products available for infants with lactose intolerance," according to Dr. Essex.

Note 1. Concerned parents should telephone the Plunket Society's free telephone on 0800 101067 for more information. Note 2. Similar articles appeared on this same day in the *Hawkes Bay Herald Tribune, Dairy News (New Plymouth), Southland Times, Nelson Evening Mail, Marlborough Express, Evening Standard (Palmerston North), Bay of Plenty Times (Tauranga), and Gisborne Herald.* Address: Wellington, New Zealand.

1360. Roberts, Rosemary. 1994. Soy formulae caution urged again. *Northern Advocate (Whangarei, New Zealand).* Dec. 10.
• ***Summary:*** New Zealand research scientist Dr. Mike Fitzpatrick has again called for parents to be wary of soy-based infant formulae. Dr. Fitzpatrick, whose report on the toxicity of soybean-based products spared alarm about infant formulae, said yesterday that a Plunket statement on the subject "missed the point entirely."

Dr. Fitzpatrick said he fully supported the statement of research scientist Dr. Richard Sharpe, of the Medical Research Council in Edinburgh, Scotland, that oestrogens from whatever source should be kept to a minimum for babies.

1361. **Product Name:** Berri Soy Drink (Non Dairy) [Plain with Dietary Fibre, or Vanilla].
Manufacturer's Name: Berrivale Orchards.
Manufacturer's Address: McKay Road, Berri, SA 5343, Australia. Phone: (085) 82 1019.
Date of Introduction: 1994.
Wt/Vol., Packaging, Price: 1 liter Aseptic carton.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: The Berrivale Orchards Story. 1994? (Undated). On the rear cover of this 6-panel glossy brochure is a section on "Soy Drinks: Berrivale produces the one-litre 'Berri Soy Drink' seen in supermarkets across Australia." It is available in two flavours: Plain and vanilla. A color photo shows the front of both packages.

Leaflet titled "Berri Soy Drink." Undated. On the front cover is a lady in a white workout suit lying on her back on the floor, supported by her elbows, holding a glass of soymilk, with her legs straight up in the air–against a blue background. The text says: "Berri Soy Drink is different... made in the heart of Australia's Riverland at Berri, from soybeans grown in Australia... Unlike so many other soy drinks Berri Soy Drink is made from fresh soybeans (not imported soybean powder) and then directly filled into packs." No salt is added. Contains 40%less fat than milk. Two recipes are given.

1362. Leng, Vikki. 1994. Earthly delights: Everyday vegetarian cooking. Sydney, Australia: Thorsons. 352 p. *
• ***Summary:*** This attractive cookbook, containing many large color photos printed on glossy paper, contains many recipes for and much information about soyfoods throughout the book. One chapter titled "Tofu and soy products" (p. 283-89) includes are recipe for making tofu at home. Address: Australia.

1363. Soy Products of Australia Pty. Ltd. 1994. Soy Products–Australia, Roberts (Portfolio). Bayswater, Victoria, Australia. 17 inserts. 30 cm.
• ***Summary:*** Unlike most portfolios, this attractive and informative color presentation has photos and text printed on both the outside and inside covers. The front cover

shows the company's 4-story flour mill and three white silos at Bayswater. The inside front and rear covers tell "The story of F.G. Roberts and how he carried the message of natural health all around Australia." A composite sepia photo shows Roberts and pages from early issues of his magazine *Nature's Path to Health.* Seven color photos show the inside and outside of the manufacturing plant. On the rear cover is a list of some of the company's products.

Enclosed in the portfolio are 17 product specification and analytical methods sheets, each dated between February and May 1994. The products are: February: Full fat debittered soy flour. Full fat debittered soy grits. Full fat lightly steamed soy flour. Soy fibre flour. Soy hulls. Full fat enzyme active (E.A.) or raw soy flour. Wheatgerm stabilised.

March: Burger surprise (dehydrated product made of soy grits, potato flakes, soy flour, etc.). Burger surprise–Hot and spicy. Gluten free plain flour (contains soy, wholegrain rice, wholegrain maize, potato, and arrowroot flours). Gluten free self-raising flour (plain flour plus glucono-delta lactone and potassium bicarbonate). Test methods: Raw materials and finished products. Product specification: Safety data sheet (Types of chemicals typically used in growing soybeans–Perfecthion 1.2 litres/hectare. Lannate 1.3 litres/hectare. Endosulphan 1.2 litres/hectare. S.P.A. fogs its premises with Pyrethrum, which bio-degrades in 3 days, to control insects).

April: Comparative analysis: Fullfat soy flour & skim milk. Amino acids: Typical analysis in full fat, debittered soy flour & grits at 39% protein. Figures given in mg per gram of nitrogen.

May 1994: Rice flour (gluten free, made from wholegrain brown rice, steamed and dried prior to milling). Maize flour (gluten free, made from whole, high lysine maize, steamed and dried prior to milling).

Note: The cover of this portfolio was first printed in about 1985. Address: 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738.

1364. Food Commission (The), London. 1995. Question mark hangs over infant soya milks (News release). Third Floor, Viking House, 5/11 Worship Street, London EC2A 2BH. 1 p. Jan. 11.

• ***Summary:*** "New research published by the Food Commission today [See Living Earth and Food Magazine, page 3] shows evidence that the levels of naturally-occurring hormones (phytoestrogens) present in soya baby milks may be equivalent to giving a young infant several contraceptive pills every day. The research, undertaken in New Zealand, raises questions over the advisability of giving babies soya formulae as the biological effect of phytoestrogens could be 100 times greater than the amount of natural oestrogen a child would receive from breastmilk.

"The Food Commission has also discovered that UK Government experts called for monitoring of the phytoestrogens in soya formula in 1992 but, despite being on MAFF's 'priority list', the research has yet to start.

"Phytoestrogens can be toxic to animals and could potentially decrease fertility in women yet little is known about their effects on children. However one leading UK researcher is recommending that oestrogens from whatever source should be kept to a minimum especially during childhood." Address: London, England. Phone: 071 628 7774.

1365. Roberts, Rosemary. 1995. New voice urges care with soy formula. *Northern Advocate (Whangarei, New Zealand).* Jan. 18.

• ***Summary:*** David Russell, chief executive officer of the Consumers Institute (in New Zealand) said this week that people should be "'very, very cautious' about giving infants soybean-based formulae. Mr. Russell said scientists had shown there was cause for concern because of the high phyto (plant) oestrogen content in the formulae."

"Yesterday in Britain, the British Food Commission's magazine, The Food Magazine, published the results of Dr Fitzpatrick's research, highlighting his comments on the probable risks of feeding soy infant formulae to babies.

"The magazine also reminded readers that in 1992 the United Kingdom's expert committee on toxicity recommended that levels of phyto-oestrogens in soy baby milks and other soy foods for children be analysed as part of its review of natural toxicants in foods.

"No research had yet been done, the magazine said.

"The British Food Commission also asked companies supplying soy baby milks in the UK to provide information on levels of phyto-oestrogens. Only one company had done so, and the level appeared to be about two-thirds that in New Zealand formulae.

"Dr Iain Robertson, senior toxicologist at the Auckland Medical School, has also restated the strong views he expressed last month on the use of soy infant formulae. Reviewing the Fitzpatrick report, he said use of soybean-based infant formulae should be discontinued until research on their possible effects on babies was carried out."

1366. Roberts, Rosemary. 1995. Soybean processing under scrutiny. *Northern Advocate (Whangarei, New Zealand).* Jan. 27.

• ***Summary:*** This article also appeared in *Marlborough Express* 31 Jan. 1995.

1367. **Product Name:** Soya Mayonnaise [Lemon and Honey, Organic Herbed].
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484, Australia.

Phone: (066) 72 5931.
Date of Introduction: 1995. January.
Wt/Vol., Packaging, Price: 375 ml glass jar.
How Stored: Refrigerated.
New Product–Documentation: Letter (fax) from Greg Nance-Kivell. 1996. April 2. "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse." Greg was asked to come in as a consultant in late 1991. Soy Mayonnaise was launched in Jan. 1995. Flavours: Lemon and honey, and Organic herbed. Packed in 375 gm glass jars.

1368. **Product Name:** Dressings and Sauces [Basil, Avocado, Satay, and Mango-Chilli].
Manufacturer's Name: EarthStar.
Manufacturer's Address: 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484, Australia. Phone: (066) 72 5931.
Date of Introduction: 1995. January.
Wt/Vol., Packaging, Price: 375 ml glass bottles.
How Stored: Shelf stable; refrigerate after opening.
New Product–Documentation: Letter (fax) from Greg Nance-Kivell. 1996. April 2. "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse." Greg was asked to come in as a consultant in late 1991. The dressings and sauces were launched in Jan. 1995. Flavours: 1. Basil, lemon, garlic. 2. Avocado, ginger, garlic. 3. Satay. 4. Mango, chilli. All are based on cultured soymilk yoghurt and packed in 375 ml glass bottles.

1369. Kelly, G.E.; Joannou, G.E.; Reeder, A.Y.; Nelson, C.; Waring, M.A. 1995. The variable metabolic response to dietary isoflavones in humans. *Proceedings of the Society for Experimental Biology and Medicine* 208(1):40-43. Jan. [21 ref]
Address: 1, 4-5. Dep. of Surgery, Univ. of Sydney, New South Wales 2006; 2-3. Dep. of Metabolic Mass Spectrometry, Royal Prince Alfred Hospital, NSW. All: Australia.

1370. Messina, Mark J. 1995. The effect of phytoestrogens and isoflavones in soyfoods on reproduction and fertility: We are about to see a wave of negative information, but important questions need to be asked (Interview). *SoyaScan Notes*. Feb. 8. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Richard James, an American who lives in New Zealand, fed his parrots a soy-based formula feed and they died. He blamed the soy. He got a New Zealand toxicologist (Mike Fitzpatrick, who works for the government) to do a report on toxins in raw or heat-treated soy, including all the well-known antinutritional factors. The report showed a lack of knowledge of the subject. It was a classic example of a little knowledge being dangerous. The conclusion of the report was that there are many toxins in soy, and that may explain why the parrots died–although it is too early to tell. However James is very dedicated about warning people about the possible dangers of soy. The health department of the Government of New Zealand sent out a questionnaire to soyfoods manufacturers asking them to indicate the levels of various antinutritional substances in their products, can they show that these products are safe, etc. For example, Bean Supreme in New Zealand has been seriously affected by this problem.

The main concern is with phytoestrogens, and more specifically with isoflavones. The two main isoflavones in soy are genistein and daidzein. Mark feels this is a very legitimate and serious concern, especially as it relates to reproduction, fertility, infants, and children. However he believes that in the end, scientific research will show that this is not a problem. This concern has now spread to England, Canada, and Australia. Mark got a copy of a document that was on the Internet; it discussed the many toxins in soy. It said that the information in this document came from an article on toxins in soybeans in the January 1995 issue of *Food* magazine (published by the Food Commission in London).

Nowadays when Mark appears on radio talk shows, roughly one-third of the calls are negative. Mark is now hearing a great deal of incorrect, negative information about the phytoestrogens in soy; some people are very afraid of their potential toxicity. In a book by John Thomas titled *Young Again: How to Reverse the Aging Process* (1994) the author had a chapter on soybean toxicity, in which he warned people not to consume tofu because of the lectins it contains. It was ridiculous; this is a non-issue.

In 1946, reports began to appear in the Australian veterinary journals concerning the decrease in lambs from ewes grazing in subterranean clover *[Trifolium subterraneum]*. In some cases lambing fell below 10% of normal with a 30% loss in ewes. It was shown that the presence of 7-10 grams/day of genistein in ewe rations resulted in sterility or infertility of the female. In 1987 Ken Setchell and coworkers, in an international symposium paper titled "Dietary factors in the development of liver disease and infertility in the captive cheetah," reported that the soy component of diets fed to captive cheetahs, which was added for economic reasons, was responsible for the severe breeding problems in these animals.

More recently the Perinatal Nutrition Group (one of the dietetic practice groups of the American Dietetic Association; see Gunderson 1994) suggested that women who were trying to get pregnant not consume excessive amounts of soy.

Starting about 6 months ago, Mark began telling leaders of the soyfoods industry that they need to write a report refuting the rising tide of false information related to isoflavones. He has even contacted people at ADM, and they offered, along with other companies, to help fund a review of the literature on the toxicity of isoflavones.

A recent issue of *The Soy Connection* (a professional journal which Mark edits) was devoted to the subject of phytoestrogens and isoflavones. It showed the need for more research on this subject, since scientists realize how potent the isoflavones are. One cup of soymilk contains about 40 mg of phytoestrogen. For example, if 25 mg have a noticeable effect in extending the length of an adult woman's menstrual cycle, what will be the effect of 100 mg in a 1-year-old child–roughly 24 times the dosage on a body-weight basis. People are saying that 1-2 cups of soymilk may contain approximately as much estrogen as is found in 3-4 contraceptive pills, however Mark thinks that one cannot make direct comparisons because the phytoestrogens are different, and are absorbed and metabolized differently. Dosage is clearly the key. But scientists do not yet understand the effect of this relatively large dose of phytoestrogens on the development of an infant. How much soymilk can be safely consumed by young children (who have been weaned). Should Mark feel safe in recommending that vegans consume 3 cups of soymilk a day in place of 3 cups of cow's milk?

In Sept. 1994 the National Cancer Institute had a meeting that focused on the subject of isoflavones. A number of researchers were honestly concerned about unanswered questions regarding the effect of soy isoflavones on humans. Researchers call these "toxicity" questions, and there are a number of disagreements among researchers. The key issues are fertility, sex hormones, and gonadotropins (hormones which stimulate growth or function of the ovaries or testes). Do normal doses make it more difficult for women to become fertile? Are three servings of soyfoods a day better or worse than two servings, or no servings? Can one level of consumption reduce cancer risks, while another increases those risks? Can the ideal does of isoflavones for reducing cancer risk simultaneously cause fertility problems? Do isoflavones behave differently when studied as an isolated compound versus when they are consumed in the form of food with many other substances (e.g. genistein and daidzein consumed together, which is always the case with soy, vs. separately).

The answers will always be related to dosage. Studies can be done on animals, but the conclusions may not be correct when applied to humans. Clinical studies are problematic. If you go to the FDA and you want to prove that genistein (an isolated substance) is safe so you can sell it in pill form, you will be required to conduct a series of standard toxicity tests, starting with two species. If there is no toxicity at the maximum tolerated dose, then you conduct human studies, looking first at absorption and metabolism (kinetic) studies. Then you proceed with the standard FDA protocol.

Bad news can travel very fast, and bad news can easily cancel good news. Remember the dramatic effects of the story of Alar and apples. Imagine the damage that would be done to the soyfoods industry if there were a major half-true TV documentary on problems of isoflavones in soy. The soyfoods industry and Soyfoods Association of America needs a plan of action to deal with this problem. The first thing we need is a brief 2-page report summarizing what we know and what we don't know about isoflavones and phytoestrogens in soy–a review of the most relevant literature. There should be one for consumers and one for professionals (with say 30 citations). The report should be written by the leading American experts in this field–especially related to toxicity, reproduction, and sex hormones. This would give us something to deal with the rising wave of negative information that is coming. We must remind critics that much scientific information shows benefits of consuming isoflavones, and entire populations in East Asia have consumed soyfoods for centuries with no known adverse health effects and probably many benefits. Moreover, reproductive effects is a cheetah, for example, do not necessarily apply to humans. It is very unfortunate that the debate on isoflavones has been picked up by the media before it has been resolved by the scientific community. This has the potential to be the biggest problem yet faced by the soyfoods industry worldwide. "If I owned stock in a soyfoods company right now, I'd be worried and I'd do everything I could to try to make sure the industry is ready to counteract any negative publicity.

Update: 1995. April 27. Sales of infant formulas in New Zealand have decreased significantly since the negative publicity started. Mark has calculated, based on published data, that an infant consuming 1 liter/day of a reconstituted infant formula based on isolated soy protein would be consuming about 40 mg/day of isoflavones. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 206-379-9544.

1371. Weber, Marcea Newman. 1995. Re: Work with natural foods and tofu in England and Australia. Letter to William Shurtleff at Soyfoods Center, Feb. 12–in reply to inquiry. 3 p. Followed by 2-page letter of March 3. • ***Summary:*** Marcea and Daniel Weber met in Boston in about 1972, and both studied macrobiotics. They left Boston in 1974 to live in England because Daniel wanted to study acupuncture in one of the acupuncture schools in Buckinghamshire. They stayed there for 6 months and then moved to London, where they connected with Bill Tara, who was working at starting an East West Centre. Marcea began teaching cooking classes and started a Wholefoods Bakery with an English woman. This continued for 1½ years.

During this time Marcea met Bruce Gyngell, an Australian who met Michio Kushi while he was in London. Michio suggested that Bruce change his diet, so Bruce came to the East West Centre and studied cooking. He was looking for a cook for himself. He was at that time living in England and working for one of the television studies. He was the person responsible for bringing television to Australia, so he was quite influential. He wanted macrobiotics to find its way to Australia, so he invited Marcea and Daniel to visit Australia and bought them each a round-trip ticket. He said they could see if they wanted to stay and start a centre in Australia. So in 1976, after visiting Japan and Oki sensei and his Oki Yoga Dojo in Mishima, Japan, for several weeks, they arrived in Australia, and have lived there ever since. In December 1982 Marcea and Daniel Weber were married in Australia.

"The Soy Bean Factory was established in Dec. 1978, when Michael De Campo, Yoshiko Wright and Marcea Weber started a company devoted to producing traditional Japanese tofu using nigari (a sea water extract) as a coagulating agent. The fresh Japanese-style tofu began to arrive in the health food stores and Japanese supermarkets around April 1979." As far as Marcea knows, theirs was the first Caucasian-run tofu company in Australia. It was her idea to start the company. Shares were issued at the beginning. Marcea initially invested about $5,000 to $7,000, Yoshiko Wright was brought in to invest about $3,000, and Michael De Campo invested about $3,000 or a little less. His main role was making the tofu and working with Marcea on improving product quality.

"The Soy Bean Factory was located just outside Chinatown and in the central district of Sydney, New South Wales, Australia. We concentrated on making a tofu equal in quality to the fresh tofu sold in Japan today. We were able to service people who wanted fresh tofu by selling it straight from the Factory to the public, as well as packaged in a plastic container with a plastic film on top."

The Soy Bean Factory ceased operation in October 1981. Note: On 8 Nov. 1981 Marcea wrote Bill Shurtleff, on a letterhead of the East West Foundation, 363 George St. in Sydney: "Our factory has shut down, and now one of the Chinese producers [Sin Ma Trading Co., 9 Meeks Road, Marrickville (in southwestern Sydney), NSW] is allowing us to use their premises to make our tofu... We are hoping to start another factory with more capitol behind us. Unfortunately, we were grossly undercapitalized, and this was our downfall." While making tofu at Sin Ma Trading Co., The Soy Bean Factory continued to use its original name, since they had lots of packaging and labels, and no need to change names.

"After getting into the swing of making Japanese-style tofu and using the packaging equipment, we decided to find a source of organically grown soybeans that would produce the same quality tofu as the non-organic beans we had been using. In 1983, after several months and many trials, we finally found a bean that would give almost the same quality, though with a small drop in tofu volume [yield].

"As the demand increased up to as much as 600 pieces per week of tofu (each piece weighed 300 gm), we began to look for larger premises, which were found in Leichhardt (about 7 miles southwest of downtown Sydney), so by early 1982 we had re-located to 355 Parramatta Road, Leichhardt, NSW 2040–and had started making tofu. At that time, Yoshiko Wright and Michael De Campo sold their shares to John Fenwick and me, and the name of the company was changed to Soyfoods Australia. Still having a controlling interest in the business, I hired Tony Wondal, a Chinese man, to help operate the business. A year later (in about 1983), after an increase of sales, John decided to sell his shares to Ross Ebert, and we moved to even larger premises at 14/2 Paton Place, Manly Vale (northeast of downtown Sydney), New South Wales. After a year of production and trying to make soymilk without proper soymilk equipment, I decided to sell my share of the company to Ross Ebert. I was expecting my first child in August 1985 and didn't want to be tied down to any business. So I left the tofu business and never looked back! As far as I know, Ross never put any new products out on the market and so the business only sold tofu–and still does today with new owners.

Note: In Sept. 1986 Ross B. Ebert had just spent $100,000 on fairly sophisticated soymilk equipment. He was selling soymilk fresh to Coles supermarkets in plastic bottles. In Nov. 1988 Lindsay Kotzman purchased the business, which was named Great Australian Pty. Ltd. In July 1990 Jennifer Young purchased the business, still located at 14/2 Paton Place. "The Company is Great Australian Tofu Pty. Ltd., trading as Soyfoods Pty. Ltd."

As far as Marcea knows, Sin Ma Trading Co. and Castle Trading Co. were both tofu manufacturers. Address: 56 St. Georges Cres., Faulconbridge 2776 NSW, Australia.

1372. *Ecologist Magazine.* 1995. Soybean processing under scrutiny. p. 27-33. Jan/Feb.

• ***Summary:*** A sidebar (p. 30), titled "Soya infant formula," begins: "A 1994 report from New Zealand examining the toxicity of soya questions the suitability of feeding babies soya-based infant formulas. The report was co-authored by New Zealand aviculturists Richard and Valerie James, among others, who became mystified by the range of health problems their breeding parrots–some 800 birds of 40 species–were developing, including infertility, reproductive disorders, premature maturity and death caused by immune system failure. Conferring with other experienced aviculturists and animal breeders in New Zealand, Australia and the U.S., they discovered widespread breeding, growth, and behavioural problems and deaths in finches, rabbits, poultry, guinea pigs, cats and fish. Analyses of commercial bird fed and other animal feed indicated that soya ingredients were associated with the toxic effects."

1373. Woodhams, David J. 1995. Nutritional deficiencies in soy protein based infant formulas. Whangarei, New Zealand: Soy Information Network (SIN). 15 p. March 5. 21 cm. [28 ref]

• ***Summary:*** Contents: Introduction. Soy protein based infant formulas. Trypsin inhibitors. Estrogens. Lectins. Phytic acid. Conclusions. Acknowledgements.

This booklet, written for both the lay reader and the scientist, is helpful in explaining the meaning of scientific terms such as pancreas, hypertrophy, hyperplasia, estrogen, etc.

Table 1 shows an analysis, conducted by M.G. Fitzpatrick (Grayson Laboratories Ltd.) of the concentrations (in mg/kg) of total genistein and daidzein in four commercial soy-based infant formulas: Infasoy 98 / 53. Isomil 72 / 73. Prosobee 118 / 59. Karicare 91 / 48 (Nutricia, NSW, Australia). Address: PhD, CEng, MIChemE, MIPENZ, MNZIC, 2/47 Church St., Devonport 1309, New Zealand.

1374. Lindsay, Allan G. 1995. Re: Information on Mr. F.G. Roberts of Australia. Letter (fax) to William Shurtleff at Soyfoods Center, March 6–in reply to inquiry. 1 p.

• ***Summary:*** Unfortunately this Seventh-day Adventist research center, the oldest and largest in Australia, has no information on Mr. F.G. Roberts. However Mr. Roberts has a grandson, Grahme V. Newitt (a practicing chiropractor), who lives at 443 Station Road, Box Hill, Victoria 3128, Australia. Phone: 03-890-1077. Melbourne. Dr. Lindsay phoned him and he provided no other information except to say that the head of Soy Products of Australia Pty. Ltd. (69 Power Road, Bayswater, Victoria 3153) had recently read to him a dossier on Mr. F.G. Roberts to ensure its accuracy. Mr. Newitt did not have a copy of it but he thought it could be obtained from the Soy Products company. Address: PhD, Director, Ellen G. White SDA Research Centre, Avondale College, P.O. Box 19, Cooranbong, NSW 2265 Australia. Phone: (049) 77-1107.

1375. Smith, Paul. 1995. Re: F.G. Roberts and his work with soyfoods, vegetarianism, and natural healing: Answers to questions by William Shurtleff. Letter to William Shurtleff at Soyfoods Center, March 14. 4 p. Handwritten, without signature (fax).

• ***Summary:*** F.G. Roberts used imported soybeans and imported defatted soy flours for his small scale manufacture. While Roberts aroused my father's interest in and awareness of soybeans, Roberts played no real part in growing them in Australia or in producing soy flour etc. in Australia–all of which was initiated and developed by my father, Ron Smith.

Paul started with the company in April 1980. In 1981, when he wrote a lengthy history of his company at the request of William Shurtleff, he did not even mention F.G. Roberts. Why not and how did he get interested in Roberts? "F.G. Roberts had always been around and in the background–just accepted and not really thought about. As I became more involved in the company and developing technology and products etc. I became increasingly curious as to how it had all evolved and why. I began to explore and to ask questions. I also began to appreciate from a marketing / creativity point of view, the value and importance of the company's long and rich heritage. F.G. Roberts, who had worked right up until his death in 1977, had continued to recommend the products we continued to manufacture under his brand name. Roberts was our unpaid advertising and marketing arm. With his passing we had to fill the vacuum. We had a story to tell–which we have done with partial success. Changing times have also called for other and new initiatives. More sophisticated specifications; research and development into new value added applications; recipes etc. An interest in combining soy with other pulses, legumes etc. e.g. buckwheat, lupins, chick peas.

The commodity / commercial soy flour and related products are used in all matter of baked goods and other preparations: doughnuts, breads, cakes, biscuits, pizzas, puddings, pastry, batters, crumbings / coatings, fresh and frozen smallgoods, glue manufacture, fish farming, pet food manufacture, soup thickenings, baby cereals, pie fillings.

Unfortunately, neither Paul nor his company, Soy Products of Australia, have much product information or catalogues etc. predating 1985. "Most of that information has been produced since under my personal influence and direction. The coloured cover A4 size with the photograph of the flour mill was produced in 1985 and is now out of date. There have been substantial alterations and extensions to the mill, buildings and the product range. It was a crude early attempt. Most of our current marketing material you already have."

1376. Roberts, Rosemary. 1995. Soybean inquiry may go to UN. *Northern Advocate (Whangarei, New Zealand).* March 16.

• ***Summary:*** "A powerful United Nations agency may take up the New Zealand Health Department investigation into levels of toxins in soy-based products."

"The UN agency, the Joint Committee of the Food and Agricultural Organisation and the World Health Organisation (JECFA) collates and assesses information on food additives, contaminants and natural toxicants."

1377. Hymowitz, Ted. 1995. New developments related to Samuel Bowen (Interview). *SoyaScan Notes.* March 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ted now has about 1,000 references on Samuel Bowen and he plans to write a book on the life and work of Bowen before he writes his book on the history of the soybean. He plans to include a bibliography with all (or almost all) of his references. His first choice for a publisher is University of Georgia Press, in part because Bowen was from Georgia. Iowa State University is also interested. Last week he entered 350 citations on Samuel Bowen into his Micropro database. Each citation has a sequential record number, but no abstract. He hopes to write during the summer. The Bowen book will probably take at least a year (of free time) to write.

Ted still has not been able to find out what happened to Sue Ellen De Berry, the mother of Marion and Allen Bowen, and the wife of Menard Kennerly Bowen.

He recently found a superb 20-page document on Bowen in French from the period 1766-69. He also has some British Parliament records from 1768-69 related to Bowen; they passed a bill saying that rice, sago, etc. would be allowed into Britain without any tax or duty. When Ted searches for obscure documents in this way, he finds nothing about 75% of the time.

Captain Cook made a trip around the world. He took Sir Joseph Banks and Dr. Solander with him. They went to Australia, where they found the first *Glycine*. On the trip they took Samuel Bowen's sago. Ted has a testimony given after the voyage by Banks, Solander, and Cook concerning Bowen's sago.

Ted also found the name of Samuel Bowen's attorney in England, and the name of Mrs. Bowen's attorney after her husband died. Then he got the attorneys' records. He also has Samuel Bowen's will.

Benjamin Franklin sent some soybean seeds to John Bartram–after Bowen. Benjamin Franklin wrote to James Flint to ask for information on soybeans (Caravances). Flint wrote Franklin with a description. Ted found the letter in Franklin's records.

Update. 1995. May 21. Ted has just obtained a letter dated 1771 written by Samuel Bowen, himself. It may be part of a diary, since he describes his activities in the first person.

Update. 1995. June 13. Ted has just obtained a copy of Marion Bowen's will from southern California. Her aunt (her father's sister) was Annie Beauregard Bowen. Marion must have suffered greatly; she was legally blind at the time of her death and had arthritis. There is no mention of a Bowen family Bible or family records in this will. She left her body to a department of anatomy, so she was not buried. She gave some money to the Hopi Indians. Her attorney was Charles R. Hart, who is one of the partners in Hart & Waters, on Wilshire Blvd., Los Angeles. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

1378. Clarke, Ron. 1995. Soy conundrum. *Rural News (New Zealand)* No. 131. p. 12. March 20.

1379. Wakelin, Sue. 1995. Poisoned protein? Frightening facts about soya toxins. *Rural News (New Zealand).* March 20. Section 2. p. 1.

• ***Summary:*** About the concerns of Richard and Valerie James. Address: Consumer affairs writer.

1380. Devine, Lester. 1995. Re: F.G. Roberts and his early education. Letter (fax) to William Shurtleff at Soyfoods Center, March 21–in reply to inquiry. 2 p.

• ***Summary:*** Hobart Seventh-day Adventist College was, at the time of F.G. Roberts' childhood, an elementary school. The word "College" is used differently in Australia than it is in America. It is operating today in Hobart as a Junior Academy, named Hilliard Christian School, P.O. Box 162, West Moonah, Tasmania 7009. Phone: (002) 72 1711. It is still owned and operated by the SDA Church. The principal is Mark Hansen.

The early records of this school no longer exist. Unfortunately Hobart suffered a major catastrophe about 15 years ago–the Collinsville fire, which destroyed a significant part of outer Hobart, and all of the school's records. The resent administration of the school has been trying to find out something of its early history and believes the school was established around 1901 but no one seems to know the name it operated under at that time.

Les has talked with several people who remember F.G. Roberts, but none know the maiden name of his wife, Alice Maud.

"Probably the best source for you to contact for further information about the life and work of F.G. Roberts is Mrs. Bonnie Roberts. A widow, her late husband V. Noel Roberts, was a nephew of F.G. Roberts. Bonnie indicated this morning that she would like to help you with your research–she believes it is important that this sort of thing be done. Mrs. Roberts indicated she has lost contact with that side of the family but knows where to locate them in Melbourne and will assist in whatever way she can in getting the information you need or directing you to that end." Contact: Bonnie Roberts, P.O. Box 260, Sandy Bay, Tasmania, Australia. Phone: (002) 48-5072. Address: EdD, Regional Director for Education, Dep. of Education, South Pacific Div., Seventh-day Adventist Church, 148 Fox Valley Road, Waroonga, NSW 2265, Australia. Phone: (02) 489-1271.

1381. Hymowitz, Ted. 1995. Plate tectonics and the dissemination of the soybean (Interview). *SoyaScan Notes.* March 24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Plate tectonics has nothing to do with the cultivated soybean, *Glycine max,* but it helps explain the dissemination of the wild perennial relatives of the soybean.

Plate tectonics has to do with the pool of genetic material which ultimately ended up in Australia, versus that pool which we seen in China and Japan today. Ted is interested in the distribution of the genus *Glycine* (pronounced glai-SEE-nee). The question is "Is the distribution of the wild perennials associated with the distribution of the soybean. The answer is "No."

Ted believes that the ancestors of both the wild perennials and the cultivated soybean were in Cambodia, Laos, and Vietnam. This has nothing to do with his contention that the soybean was first domesticated in the eastern half of North China around the 11th century B.C. These ancient ancestors existed something like 4 to 10 million years before the soybean was domesticated, roughly 3,000 years ago. From this pool of genetic material that moved north, *Glycine soja*, the farmers of China domesticated the soybean.

The Australian plate is moving closer and closer all the time to the plate in the southern part of Asia–especially Indonesia and Papua New Guinea. Eventually the two plates hit, and one plate went under the other. At that time there was a golden opportunity for what he believes to be the *Glycine* to move down from Southeast Asia into Australia. The plants that moved south remained perennials. But the plants that went north from this center were annuals; they eventually became the wild annual soybean, *Glycine soja*. Kudzu comes from that same pool. Botanists know that perennials can't survive in the cold north, so when tropical plants move north they often become annuals in order to survive.

Confounding this whole issue of plate tectonics are wild birds. They can move the seeds of wild perennial relatives of the soybean over long distances. Some seeds retain their viability during the time they are eaten by the birds, digested, and excreted. One day while Ted was sitting alone on the Pescadores Islands, he asked himself, "How could the wild soybean have gotten here?" To demonstrate this bird theory of movement, Ted and his colleagues took material that they collected on Taiwan, Pescadores Islands, Okinawa etc. and they crossed it from the material from Australia. The resulting seeds were fertile. That shows that the genetic material had to come from Australia because on the Philippines and Taiwan you only find the polyploids; you don't find diploids. The ancestors of the polyploids, those 16 species, are only found in Australia. But the polyploids, the ones composed of more than one genetic background, are found in Taiwan and elsewhere. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

1382. Kirk, Bruce. 1995. Re: Soy proteins–Article and editorial comment on "toxicity." Letter to Martin J. Edwards, New Zealand Ministry of Health, March 29. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "Please find attached an article which appeared in last week's 'Rural News' and editorial comment related to 'toxicity' of soy beans and further processed products.

"This article is potentially damaging to the entire soy industry and makes inference to harmful effects of consumption of refined soy proteins eg [sic, e.g.,] isolated soy proteins in areas of human health without any credible scientific support."

"In summary we find the article extremely biased, defamatory of all soy products and very critical of the Ministry of Health. We have also already received concerned response from several of our key users of Supro isolated soy proteins." Address: Columbit [New Zealand] Ltd., 33A Rennie Dr., Mangere, P.O. Box 29093 Greenwoods Corner, Auckland 3, New Zealand.

1383. Birbeck, John. 1995. Soy debate. *Nutrition News (New Zealand Nutrition Foundation).* March. p. 1-2.

• ***Summary:*** Discusses the views of Dr. Mark Messina (a private soy consultant and advocate from the USA) and Professor Cliff Irvine (Prof. of Animal & Veterinary Science at Lincoln University, New Zealand, with a particular interest in human reproduction). Prof Irvine "maintains that infants are more susceptible to the effects of oestrogens and is surprised at the dearth of information and lack of research. He raised questions about the long term serious effects of synthetic hormones in the 40's, through to the 70's. However it should be noted that the effects recorded related to only one specific synthetic substance (DES) and not to the many others used."

1384. *Living Earth & Food Magazine (Food Commission, London).*1995. New Zealand research questions safety of hormones in soya baby milks. Jan/March. p. 3. [1 ref]

• ***Summary:*** The Food Commission is a UK consumer advocacy group. "The Food Commission has received evidence from New Zealand that soya formula milks for babies contain levels of chemicals, known as phytoestrogens, which, the researchers say, give young babies the equivalent of several contraceptive hormone pills a day*. (Footnote: *James et al. 1994. *The Toxicity of Soybeans and Related Products*). The research has been widely reported in the New Zealand press with calls for soya formulae to be withdrawn from sale."

"The Food Commission asked companies supplying soya baby milks in the UK to provide information on levels of phytoestrogens. As we went to press, only one company, Wyeth, which makes SMA Wysoy formula, was able to provide the Food Commission with figures. SMA told the Food Commission: 'Our soy formula contains no more than 20-28 micrograms/ml (of phytoestrogens) in the reconstituted product.'

Sales of soya-based infant formulas are worth nearly £9 million a year from the 3% of babies in the UK who are fed soya-formula, with about 85% of sales on prescription.

1385. Smith, Paul. 1995. The life and work of F.G. Roberts, naturopath, and Australia's first soyfoods pioneer. Part I. The early years, 1892-1926. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** Paul Smith is Director and General Manager of Soy Products of Australia Pty. Ltd. (69 Power Road, Bayswater, VIC 3153, Australia). This company was taken over in Aug. 1936 by an Australian naturopath named F.G. Roberts (lived 1892-1977), at which time the name was changed to F.G. Roberts Health Food Products.

Prior to that it had been known as Willson Health Foods, Naturopath, Dentist & Manufacturer (1932 to Dec. 1935), then Drummond's Health Products (Jan to July 1936). It appears that Roberts' son, Horace, may have joined Willson in 1932, and that Willson manufactured products for Roberts as well as for himself. In the July 1930 issue of *Nature's Path to Health* (NPH) (Melbourne), Mr. W.H.J. Willson was Melbourne Branch president of the Natural Health Societies and Mr. David Evans was secretary of the Ballarat Branch. F.G. Roberts was the founder and national president. In the Dec. 1930 issue there are advertisements for Drummond's Health Products.

In the Aug/Sept. issue of NPH we find the first "Directory of Health Aids," a consolidation of previously scattered advertisements. In it appears an advertisement for: "Mr. W.H.J. Willson (Melbourne, President of Natural Health Society), 40 Chapel St., East St. Kilda. A nature cure dentist." From Jan/Feb. 1936 to 15 July 1936 in NPH we find: "Drummond Health Food Products, 40a Chapel Street, East St. Kilda." Apparently Mr. Willson was "consulted" by the Dentistry Board about his activities as "Dentist, Naturopath, Food Manufacturer" and forced to choose. It appears he chose dentistry, and sold the factory at the rear of his house, which became 40a Chapel Street. Paul Smith states (28 March 1995): "It appears that Wilson and Drummond manufactured Roberts' products prior to 1936... It appears that Willson began manufacturing products in 1932.

Roberts made the 11 earliest soyfood products sold in Australia. Ron Smith, Paul's father, was a pioneer in commercial soybean production in Australia, starting in the early 1950s.

Frederick Roberts was born on 11 Nov. 1892 in Hobart, Tasmania, the son of William Thomas Roberts and Ellen Bloomfield, both Seventh-day Adventists. He was one of eight children, including Arthur, George, Whit, William Edgar ("Bill"), and Kate. Their order of birth and the names of the other two are unknown. His parents came from Wales. In later life he was best known as F.G. Roberts. The "G.," which initially came from the first name of his wife Gladys, was later changed to "George" to add a little distinction to plain Fred Roberts. He attended primary school at the Hobart Seventh-day Adventist College.

While still in his teens [sic, age 22], Fred Roberts married Gladys Maude Griffiths in 1914 in Hobart, Tasmania. Born on 13 July 1895 in Hobart, Tasmania, she was the daughter of Edley James Griffiths and Susan Jane Mason. No additional details are given in the register of marriages. On the birth record, her middle name is spelled "Maud," but on the marriage record "Maude." Born an Anglican, Gladys became a devout Seventh-day Adventist, in part at least on her husband's behalf. They soon had three children: Fred, Jr. (born 14 Sept. 1911 in Hobart), Horace Eric (born 30 Sept. 1914 in North Lyell; died 1943), and Gladys Ellen (born 25 Feb. 1916 in North Hobart). The children, all born in Tasmania, probably in Hobart, were raised in the Seventh-day Adventist faith. Gladys, the daughter and youngest child, was later married three times, to Messrs. Newitt, Grimes, and Hawken.

In 1912 Fred Roberts began his studies in health and natural therapies as a result of the death of his father, William Thomas Roberts, from a hernia operation. Qualifying as an electrician by trade, he worked in Hobart and Mt. Lyell prior to the outbreak of World War I in 1914. He volunteered for an Engineer Reinforcement Corps but was excused from active service on compassionate grounds since he had married young and already had a young family. Moreover, his wife, Gladys, was strongly opposed to him undertaking military service.

In 1918, he left for England, where he studied at the British College of Naturopathy, learning the natural healing methods used in chiropractic, osteopathy, herbalism, dietetics, homeopathy, and hydrotherapy. During this time, his wife stayed behind in Tasmania with their children.

Returning to Hobart late in 1920, he moved his family to Burnie, Gladys' home town, on the northern coast of Tasmania. There he continued his work as an electrician. In 1923 he established his first clinic in Tasmania, where he engaged in chiropractic and osteopathic work. He often took people into his home for hydrotherapy treatment. Meanwhile he and his wife continued to read and study everything they could get their hands on from England and elsewhere related to naturopathy; this enabled them to steadily expand the areas of their clinical work.

While in the U.K., F.G. Roberts had also worked with ultraviolet and infrared lamps, and he was responsible for introducing them into Australia and using them in the treatment of asthma and certain skin disorders. Next the Roberts family moved to Launceston (in the northeast corner of Tasmania on the Tamar River); there they opened their first rest home or "Health Academy" and added dietary advice and herbal treatments to their range of health services. F.G. Roberts, who was born into a SDA family, was first baptised into the Seventh-day Adventist church in

Launceston by Pastor Letts. About 2 years later the Roberts family returned to Hobart, establishing another rest home in Kingston and treatment rooms in Central Hobart, where he began practicing iridiagnosis [iridology, the study of the iris of the eye for indications of bodily health and disease; the term was first used in about 1923], and prescribing diets and herbal remedies, etc. Iridiagnosis became a lifelong study, constantly honed.

He became very skilled at using herbs therapeutically, and at diagnosing people, especially by examining the iris of their eyes. He was very interested in the work of Dr. Harry W. Miller (even though there is no record that the two men met) in China during the 1920s and early 1930s. He was also very interested in children who suffered from eczema, colic (abdominal pain), and mucus problems from milk. Continued. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1386. Smith, Paul. 1995. The life and work of F.G. Roberts, naturopath, and Australia's first soyfoods pioneer. Part II. Early years in Australia, 1927-1932. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** Continued: In early 1927, after his clinic in Hobart was well established, F.G. Roberts traveled to Melbourne (in Victoria, southern Australia), where he became licensed in 1929 and established his first mainland clinic at Latrobe Street and commenced his well-known lectures. Initially his wife kept the clinic and rest home going in Hobart, then she and the children joined him in Melbourne in late 1927, when the family took up residence in Mordialloc, later moving their house and clinic to 232 St. Kilda Road.

In Nov. 1928 F.G. Roberts and his wife, Gladys, from their headquarters in Melbourne, began publishing a magazine titled *Nature's Path to Health* (NPH). The first issue was volume 5, number 5–raising many questions about previous volumes and issues. They continued publishing NPH until 1951-52. Gladys was a major contributor, serving as editor, publisher and even writer of articles when her husband was away. In later years, Gladys was assisted by her sister, Muriel Ackerman. The magazine became Roberts' main vehicle for announcing his lecture and travel plans, advertising his products, and disseminating his ideas about health, naturopathy, and diet.

In 1929 Roberts established the Australian College of Naturopathy and began offering lectures and study courses, including some in chiropractic; he used his home as the organization's first headquarters. Soon more space was required, so the Roberts family moved to 428-430 St. Kilda Road, where they also established yet another rest home.

During 1930, 1931, and 1932 frequent advertisements appear in *Nature's Path to Health* (Melbourne) for F.G. Roberts interstate lecture circuit, giving dates and venues. He established centers in Sydney and Newcastle (New South Wales), Brisbane, Ipswich, Toowoomba (Darling Downs), Maryborough, Bundaberg, and Rockhampton (Queensland). After traveling this northern circuit by train, he would return to Melbourne for several weeks to rest and attend to his duties there, prior to traveling by car to Ballarat and Geelong (both in southern Victoria), where he had also established centers. Then he was away by train to Adelaide (South Australia), and Fremantle (near Perth, Western Australia). He loved to travel, and in all these places he lectured and treated people. He also participated in radio (wireless) interviews and programs. As his students became qualified, he opened clinics and shops to give the public the goods and services he felt they needed. During this time he closed the St. Kilda Road Clinic and opened a new clinic at Post Office Place.

At about this time, F.G. Roberts may well have traveled to the United States. Esmae N. Jackson (born in 1937), the Roberts' granddaughter, recalls vividly that he told her about several visits (at least two) there during her years in primary and secondary school; she does not know when his trip took place but thinks vaguely late 1930s to mid-1940s. She recalls her grandfather mentioning Loma Linda (which was named College of Medical Evangelists from 1906 to 1 July 1961, when it was renamed Loma Linda University). Paul's father, Ron Smith, has no recollection of F.G. Roberts going to the USA between 1948 and 1954. If Roberts did go, there are three good reasons for thinking he may well have visited Benedict Lust (pronounced LOOST; rhymes with "boost"), who was based in New York. First, Lust published (from July 1925 to 1960) a naturopathic magazine titled *Nature's Path* (New York City). In 1930 F.G. Roberts, assisted by his wife (Gladys), began editing and publishing a bimonthly (later monthly) magazine titled *Nature's Path to Health*. He continued to publish it until about 1952. The magazine was published in Melbourne and Gladys kept it going during her husband's travels. Some articles by Benedict Lust appeared in the Roberts' Australian periodical. And articles by other writers, first published in *Nature's Path* (USA) later appeared in the Australian magazine. By Sept. 1939 Lust appears on the magazine's masthead as "American Contributing Editor"–all indicating a spirit of cooperation and friendship.

Second, the Sept/Oct. 1937 issue of *Nature's Path to Health* (Australia) states (p. 14): "The Naturopathic School of Dr. Benedict Lust conferred on F.G. Roberts, N.D., D.O., D.C. [doctor of naturopathy, osteopathy, and chiropractic], of 430 St. Kilda Road, Melbourne, Australia, the Degree of Dr. of Natural Therapeutics." Esmae believes the honorary doctorate arrived by mail, and that F.G.R. was enormously proud of the honour.

Third, Dr. Lust was widely considered the world's leading practitioner of natural healing (naturopathy) at the time, and it seems likely that an energetic, curious, and dedicated man such as F.G. Roberts would have wanted to meet him, to talk with him about their mutual interests, and perhaps to study Lust's organization, publications, and healing methods. Note: A careful examination of Dr. Lust's magazine might mention a visit from Roberts.

During the 1930s Roberts began to import a range of packet herbs, tablets, and other herbal remedies from Potter and Clark in London.

In 1934-35 F.G. and Gladys Roberts established a restaurant named the Curative Dining and Health Service, on the 2nd floor, 300 Little Collins St., Melbourne. It was renamed Cafe Naytura (see ad in 15 Aug. 1936 NPH). (Note: In 1943 Sanitarium Health Food Co. [SDA] had a cafe and natural food store at 293 Little Collins St., Melbourne). During the 1950s it was located in the basement at this same address and run by the Cutting family. It continued at this address until the late 1970s, when it was purchased by Don Newsome, a pharmacist, and moved to its current Bourke Street Mall location. Don used his experience to establish the Naytura Health Food Section nationwide through the Safeway (Victoria) / Woolworths supermarket chain. The Bourke St. store is used to evaluate products for potential supermarket sale and the basement restaurant still carries on the tradition of the Roberts' 1934-35 Cafe.

In the early 1930s, F.G. Roberts became interested in Mr. Willson's food manufacturing business–probably because his son, Horace, worked there. It may have been that Roberts took over the business to keep Horace in a job. F.G.R. never had the time or any real interest in running it.

In the Aug. 15, 1936 issue of *Nature's Path to Health* we find the first advertisement for "F.G. Roberts' Health Food Products, 40a Chapel St., East St. Kilda." The same appears in the "Directory of health aids." He had acquired this health food factory which had been previously named Drummond Health Food Products. St. Kilda was a beachside suburb of Melbourne, Victoria, Australia. A photo of this original red brick factory appeared in the May-June 1937 issue of *Nature's Path to Health* (p. 22); an original hangs on the office wall at Soy Products of Australia. The factory began to pack a variety of herbal products, and to manufacture some new foods, all to service the needs of Roberts' shops and clinics. Many herbs were grown locally in Australia to supplement the supplies imported from England. It was during the mid-1930s that many of the products still manufactured today by Soy Products of Australia Pty. Ltd. under the Roberts brand name were first formulated and developed. By the late 1930s F.G. Roberts, his teachings, and his products were known nationwide. From 1951 onward Potter & Clark's herbs were replaced by herbs mixed and packaged in Australia using some imported ingredients.

During this period the Australian College of Naturopathy (which Roberts had founded in 1929) became more closely affiliated with the British College and became known as the British and Australasian College of Naturopathy; the two colleges were run on the same standards and principles.

The Roberts' children had now grown up and were taking an active interest in the business, training for and working in key positions. The eldest son, Fred, Jr., and the daughter, Gladys, worked in the clinics. Fred, Jr. later moved to Brisbane and his son, Peter, carries on the family tradition, practicing as a chiropractor. Mr. Roberts was good at treating people and lecturing, but was less interested in managing the food factory, a role that his youngest son, Horace Roberts, fulfilled. Horace also managed the shop at the Post Office Place Clinic. Horace was instrumental in transforming his father's ideas into formulations and products. Starting in the mid-1930s, and continuing until the 1950s, F.G. Roberts developed a number of health food products, which were sold throughout Australia. They were hand-mixed and packaged at his factory, F.G. Roberts Health Food Products, in St. Kilda and from 1933 he was advertising them nationwide in his magazine *Nature's Path to Health*.

Several of these products contained soy flour. Prior to 1950 he launched and sold the following soy products, listed here is the order they were first advertised in his magazine: (1) Soy Wheat Macaroni (Aug. 1936); (2) Soy Bev (tea or coffee substitute; Nov. 1937) was made primarily from ground roasted soybeans and roasted milled chicory; Paul thinks it was first introduced in about 1935-36; (3) Soy Flakes (Dec. 1937); (4-5) Roberts' Soy Nut Roast; Soy Beans in Tomato (in glass, Oct. 1938; canned June 1940); (6) Malto-Soy Drink (tea or coffee substitute; Sept. 1939); (7) Soy Milk Compound (Sept. 1939; originally a mixture of soy flour, malt, lactose, and nonfat dry milk [skim milk]). This product is still made today in modified form under the name Soy Compound; Paul thinks it was introduced in about 1933 or 1934. It was made using defatted soy flour imported from America; (8) Soya Choc-Malt (Jan. 1940), renamed Soya-Choc in Aug. 1946; it was the Soy Milk Compound plus natural cocoa; Paul thinks it too was introduced in about 1933 or 1934; (9-10) Roberts Soy Nut Brawn, Soy Nut Cheese (May 1940); (11) Vita Elm (1948). This early and widely advertised herbal product was being advertised by May 1935 in *Nature's Path to Health* as a "vitalizer" that can give "Glorious Health." Vita-Elm, which always contained slippery elm, was based on an old English formula that went back to the 1750s; the company still makes the product today. Published ads from 1935, 1936, and 1949 said it contained "the Germ of Life of Wheat, Oats, Barley, Rye, Maize" (and slippery elm) but

Paul is sure that somewhere prior to 1948 it also contained small amounts of soya flour. Esmae Jackson believes that the soy was added to Vita Elm in 1937, when Roberts first became interested in it. Continued. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1387. Smith, Paul. 1995. The life and work of F.G. Roberts, naturopath, and Australia's first soyfoods pioneer. F.G. Roberts Health Food Products, and Ron Smith. Part II. Mid-1930s to 1949. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** Continued: It is not clear when and how F.G. Roberts first learned about soybeans and soy flour. Paul suspects that he read about Dr. Harry W. Miller (a Seventh-day Adventist doctor) and his pioneering work with soyfoods in China, starting in the 1930s. "There is definitely some connection and I believe it is highly likely that F.G. Roberts met Harry W. Miller." Or the two men may have corresponded. If Roberts visited Loma Linda, California, he would surely have visited Loma Linda Foods, which made a large range of early soyfoods: In 1922 they introduced–Smokene (a seasoning based on roasted soy flour). 1934–Soy Mince Sandwich Spread, Soymilk, VegeCheese, Soy Bean Spread, Breakfast Cup (coffee substitute), Soy Wafers, Soybeans with Proteena and Tomato Sauce. 1936–Soy Beans (plain, canned). 1938–Gluten Burger (with soy flour). 1940–Soy Beans with Tomato, Soy Beans with Proteena, etc.

During the 1930s, F.G. Roberts and others were experimenting with soybean cultivation in Australia on a small home-garden and experimental level. An article in *Nature's Path to Health* (15 July 1936, p. 35-36) gives details. Roberts concluded: "The Soya Bean has been very successfully grown in Australia." But there were no commercial crops until the 1950s.

In 1940 Horace Roberts, the youngest son, left the company when he volunteered for service with an ambulance corps being formed in Melbourne. Serving as a non-combatant male nurse during World War II, he was sent to Singapore. With Horace's departure, F.G. Roberts' food production business began to languish; the man who had managed the plant and attended to daily details was gone. Although the company's soy products were available during the war, it continued to languish until Ron Smith entered the business in 1948.

Meanwhile, during World War II, with the clinics and college all well established and running smoothly, F.G. Roberts turned some of his time and attention to a property at Panton Hills, an outer Melbourne suburb, between Eltham and Lilydale, where a home was built; he grew fresh fruit, herbs, and vegetables, and practiced composting. This provided family, friends, and pupils from the college with a place to visit and relax. It never made the expected profit.

Shortly after World War II ended, the Roberts family received devastating news. Their youngest son, Horace, had been captured in Singapore and interned by the Japanese in Changi, their prisoner of war camp there. He had died in October 1943 in Burma (working as a forced laborer on the Thailand-Burma Railway)–unbeknownst to his family until after the war had ended. So shattered was F.G. Roberts by the death of his son that he began to lose interest in the shop and the factory. The shop and clinic in the Post Office Place was closed and the family moved to Malvern Road, Prahran. The factory continued to run indifferently while F.G. Roberts put most of his time and energy into public lectures, the college, and seeing and treating patients.

Esmae recalls that for many years on a Thursday [sic Tuesday] night, often weekly, F.G. Roberts had addressed the public about "Health Matters" at the Athenaeum Art Gallery Hall at 188 Collins Street, Melbourne. Esmae personally attended many of these evenings, singing, playing the piano, and on one occasion addressing the audience with a speech of her own about diet and health.

In 1946 Ron Smith first came in contact with the F.G. Roberts at the Athenaeum. Vincent Ronald "Ron" and Mabel Smith, both originally from Western Australia, had married and settled in Melbourne after World War II. Ron was born on 10 December 1918 at Boulder (near Kalgoorlie), Western Australia. Mabel was born on 16 Dec. 1919 in Bunberry, also in Western Australia. Both in their late 20s and dogged by ill health, they first attended several of F.G. Roberts' lectures and later went to him for advice and treatment. Ron, in particular, was slightly built, had worn glasses for years, and had never enjoyed really robust good health. F.G. Roberts prescribed an exercise program and made radical alterations to the Smith family diet. Almost immediately the Smith family's health began to improve. Ron's physique developed and his eyes improved to where he was able to discard his glasses for nearly 30 years. Thus began a long and ongoing association with the Roberts family.

F.G. Roberts owned Green Island, a small island just off the coast of Queensland at Mackay, near the Great Barrier Reef; you could walk across at low tide. There he built a retreat to which he took his friends and pupils to enjoy the sea air, balmy climate, and the cleansing diet of fresh tropical fruits–pineapples, papayas, bananas, coconuts, and mangoes. Ron Smith enjoyed unforgettable visits with the Roberts at Green Island several times between 1948 and 1954.

F.G. Roberts had an enormous enthusiasm and an almost boundless capacity for work. When he got a bit tired or run down, he would switch off and head for Green Island for a few weeks of relaxation. He was good fun and good company to go away with. He would buy a case of good quality ripe oranges and, with his guests, would enjoy fresh squeezed orange juice and half a ripe pineapple (freshly sliced with a sharp machete and handed around to all present) for morning and afternoon tea. He practiced what he preached.

The Roberts presided over the prenatal and antenatal care of Mabel Smith during the birth of her two sons in 1949 and 1950 with beneficial results to both infants and mother. The Smiths became lifelong converts to Mr. Roberts' philosophy. Note: In 1995, at age 76, Ron Smith still comes to work at the company each day, and often puts in a 10-hour day as managing director of the company.

In early 1948, after several unsuccessful attempts to start his own business, Ron Smith went to work for F.G. Roberts. He worked as an employee at the factory at 40 Chapel St., St. Kilda, increasingly taking over the daily management and running of this operation–formerly the responsibility of Horace, the Roberts' son, who died in the war.

Although a great healer and publicist, F.G. Roberts was not strong in the technical aspects of food production or marketing. The factory at 40 Chapel St. was more like a cottage industry. It was small, cramped, and labor intensive; mechanical aids were either non-existent or very primitive. Output was small and most products were mixed and packed by hand.

Ron sparked the resumption of manufacturing, even though wartime rationing was still in place and obtaining permission to import anything was difficult. Paul recalls (28 March 1995): "Roberts, himself, was a dreamer, and far too preoccupied with travelling, treating patients, lecturing, and racing on to the next new idea. He lacked the patience, persistence, and stability to run a manufacturing business. His skills and interests lay elsewhere."

F.G. Roberts was an osteopath, naturopath, registered dietitian, iris diagnostician, and had several other natural healing qualifications. He studied by attending courses in the U.K. and by correspondence. He was first registered in Australia as a "Consultant Dietitian" in 1942-43. Continued. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1388. Smith, Paul. 1995. History of F.G. Roberts Health Food Products and Soy Products of Australia Pty. Ltd. The work of F.G. Roberts and Vincent R. "Ron" Smith. Part III. 1950-1959. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** Continued: In 1951-52 the company launched Australia's first full-fat heat-treated (dry-roasted) soya flour, which was named Soyvita. Prior to 1954 this flour was made from soybeans imported from China and the USA. From 1951 onwards, the company began mixing and packing its own range of herbs.

In May 1952 Ron Smith and F.G. Roberts became equal partners in the ownership of the food factory. In May 1954 Ron Smith bought the entire food processing business from Mr. Roberts, thus ending the partnership. Mr. Roberts kept some of the herbal products and tablets. In June 1954 Smith incorporated a proprietary company under the name "New Life Products Pty. Ltd." and in March 1958 changed the name to "F.G.R's Health Food Products Pty. Ltd."

Shortly after Ron Smith bought F.G. Roberts' Health Foods in 1954, he did two other important things: First, he bought a 3½-acre piece of land at 69 Power Road, Bayswater, Victoria–where the company is located. Bayswater is an outer Eastern suburb of Melbourne at the foothills of the Dandenongs between Croydon and Boronia (north-south), Montrose/Kilsyth and Wantirna (east-west). The property was a green-fields industrial site surrounded by orchards and daffodil farms, with no utilities connected. On this property he built a 100-square-meter storage shed, which was used to store the year's supply of soybeans in hundredweight (112 lb) Hessian sacks. The beans were then taken in small quantities to Hawthorn for dry roasting and milling as required. They were cleaned, bagged, and delivered by semi-trailers, and unloaded by hand.

Second, Smith moved the entire company from St. Kilda to larger premises at 146 Burwood Road, Hawthorn (an eastern, inner city suburb of Melbourne), Victoria–about 45 minutes drive from 69 Power Road. Initially the roaster and mill were at Burwood Road.

Not long after the Smiths purchased F.G. Roberts' food business, they also purchased a new home at Blackburn South on a bare, treeless piece of land. One Sunday, Roberts appeared with four Italian laborers and in a single day transformed the yard, planting zinnias, marigolds, etc. Paul still remembers vividly the riot of color the next summer. According to Ron Smith, F.G. Roberts was a great gardener, and wherever he went (as at homes in Kew and Panton Hills) he surrounded himself with a magnificent garden of herbs, annuals, vegetables and fruit trees.

After 1954, due to family and business pressures, contact between the Smith and Roberts family began to diminish. From all accounts, F.G. Roberts was a lively, congenial, and stimulating companion–a man of rare charm and brilliance. He was extremely widely read in all matters related to natural healing, and a learned man in every sense of the word. He also maintained an active correspondence with naturopathists and herbalists all over the world, even maintaining contact with German and Austrian colleagues during World War II. He avoided attracting attention to himself, and though he cured many people, he made no claims to such cures. He merely went about his chosen profession of helping and healing people. F.G. Roberts was active and healthy throughout his life, working right up until two months prior to his death in 1977 at age 84.

Ron Smith had fine mechanical and technical skills, and he began to expand and automate the factory, even though he was restricted by a shortage of money and the small market for health foods at that time–all the while faithfully preserving the spirit and intent of his mentor's work and often expanding on his legacy. He rebuilt old machines and adapted other machines to new uses. By studying other people's ideas, he was able to modify and adapt them to his own operation at a fraction of new commercial cost. He was an innovator, constantly improving the plant over the years to achieve greater efficiency and output. A stickler for regular maintenance and cleaning to keep the plant running smoothly, he required that meticulous records be kept of bearing performance, greasing routines, etc. Every Friday was devoted to a thorough cleaning of the plant and all its equipment. A keen browser of the technical literature, he built substantial files on all sorts of drying, milling, mixing, dust extraction, and metering equipment and systems.

During the 1950s Ron Smith, frequently accompanied by his two young sons, Paul and Ross, often visited Robert Hutchinson's Flour Mill at Glenroy and H.J. Heinz's new factory at Dandenong (both in Victoria), Australia. From these modern, state of the art plants, they gleaned valuable inspiration.

Ron Smith also carried on much valuable pioneering work, especially in the area of commercial soybean production in Australia. One of the company's major products, Soy Compound, was originally manufactured using defatted soy flour imported from the USA. This flour was often difficult to import during the 1950s, and Ron Smith began to have ongoing problems because of the flour's variable quality, flavour, texture, purity, and colour. So he asked a basic question: "Why can't we make soy flour in Australia?" Ron's research showed that there were soybeans locally available in Australia, so early in the 1950s he began to work with several farmers on experimental production of soybeans, first in the Kingaroy district of Queensland, then soon throughout New South Wales and Queensland. From 1951 to 1957, Ron purchased soybeans from Elmo W. Semgreen of Kingaroy, from Kel Maundsley from Murgon (near Kingaroy). Incidentally, Semgreen married one of F.G. Roberts nurses and became interested in soybeans through Roberts. From 1954-55 Ron also purchased soybeans from the Young family (of Chinese extraction–pioneers of commercial soybean production in Kingaroy), who grew them under contract specifically for him. Experimental plots in the Smith's backyard at Blackburn (a Melbourne suburb about half way between Hawthorn and Bayswater), in 1953, 1954, and 1955 produced healthy plants, flowers, and pods full of beans. Unfortunately temperatures and sunlight hours were not adequate at this location, so the beans did not mature and dry properly. Using Australian-grown soybeans, Ron Smith initially continued to use the small and primitive batch roasting and milling system located at the Burwood Road plant, which had been developed to process the imported beans. This improved the quality, reduced the cost, and put the raw material supply directly into the hands of the Smith family.

Early in 1954 the company first began to process Australian-grown soybeans; the first product made from them was Soyvita, a dry-roasted soy flour, similar to Japanese kinako. As soon as the company began to use locally grown soybeans, the soy processing business began to develop steadily as other local companies preferred local, timely production to the costs and difficulties associated with the imported product(s).

From the mid-1950s to the mid-1980s the company purchased most of its soybeans from the Darling Downs, an agricultural region in Queensland. The construction of huge man-made irrigation lakes and bores on the Darling Downs increased soybean yields and reliability–and the area was closer to the SPA plant. John Bligh, the Todd family, and the Behrendorf family were among the company's main suppliers for many years.

In about 1954 H.J. Langdon, a major importer, exporter, and seller of food ingredients, took an interest in buying soy flour from Soy Products of Australia. Starting in 1955 they had it private labeled under the brand name Soybake. It was extremely gratifying at the time to enjoy the support in marketing and distribution of soy flour by such a large and well established company, founded in the mid-1800s.

Brockhoff, a major Australian biscuit manufacturer established in Victoria since 1880 (acquired by and now part of Arnotts Biscuit Group of Companies, which is now owned by Campbells), started to buy soy flour and contract other products and services from F.G. Roberts. Shortly afterwards, Heinz began to use the soy flour as a thickener in many of their soups; they continue to do so to this day, exemplifying the gradual acceptance and increasing usage of soy for both technical (functional) and nutritional reasons in many varieties of popular foods. As Australian companies heard that soy flour and related products were being made in Australia, they decided to buy locally rather than import. Even Australian politicians helped; during the 1950s they were very concerned about the country's balance of trade and avoiding foreign debt, and they worked to make Australia more self sufficient.

In June 1957 Ron Smith founded Soy Products of Australia Pty. Ltd., and in Sept. 1957 had the new company formally registered and incorporated. So at that time he owned two active food companies, with headquarters at 146 Burwood Road, Hawthorn, and soybeans storage at 69 Power Road, Bayswater, both in Victoria.

During the 1950s the company continued to introduce new products. It canned soybeans, continuing F.G. and Horace Roberts' pioneering work in 1939-40, and lima beans, and bottled cider vinegar. In 1953 the company began exporting Soy Compound to New Zealand and continues to do so to this day (1995).

Demand for the dry-roasted soy flour and grits grew steadily over the years. In 1957-58, after electricity, gas and water services had been connected at Bayswater, the rather primitive roaster and then finally the mill were scaled up moved to the shed at Bayswater. The main mixing, packing, dispatch, and administration operations continued at Hawthorn. Continued. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1389. Smith, Paul. 1995. History of Soy Products of Australia Pty. Ltd., and the work of Vincent R. "Ron" Smith. Part IV. 1960-1979. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** Continued: By 1961 roasted whole soy flour was being produced at Bayswater 7 days a week, almost 24 hours a day. So that year an American consulting engineer, George Lloyd Levin, from Minneapolis, Minnesota, was hired to help design a much larger and more sophisticated, 4-story flour mill (including dehulling, steaming, drying and grinding) at 69 Power Road, Bayswater, to the rear and adjacent to the 1954 shed.

On 1 April 1963 this mill began to manufacture soy flour using a new process in which debittering has replaced dry roasting. Previously, the company was roasting and milling whole soybeans. Now they crack and dehull whole soybeans, before they steam, dry, and mill them. This new mill could produce more soy flour in one day than its predecessor could produce in a week using previous methods–and the quality and flavour were infinitely better. Eventually (in 1969-70) the bagged beans were replaced by the first bulk handling system. The plant and its processes have been continually improved in the areas of intake cleaning of the soybeans, throughput, and quality control of fineness, product purity, and microbiological standards, ever since the initial plant construction.

The 1964 *Soybean Blue Book,* in the section titled "Foreign processors" (p. 96), contained its first entry for Soy Products of Australia Pty. Ltd., at Woodmason Rd., Bayswater, Victoria. The top men were T.W. Harvey, V.R. Smith, and H.G. Eakins. Storage capacity: 20,000 bushels. Manufactures "Soyvita" full-fat soy flour. Approximate soybean operations 50% [i.e., 50% of its processing was done on seeds other than soybeans].

In 1965 Ron and Mabel Smith developed and manufactured two soyabean meat substitutes–Soya Bean Luncheon Loaf, and Savoury Roast–for Bellevue Health Supplies, as part of their product range within F.G. Roberts' Health Foods Proprietary Ltd.

By 1968 the contract milling and health food manufacturing operations at 146 Burwood Road, Hawthorn, had also outgrown the available space. So in April 1968 these operations were moved into newly expanded and constructed premises, including a new warehouse and manufacturing and packaging area in the Bayswater plant. Since 1968 the facilities and technologies at Bayswater have continued to expand and develop.

In the late 1960s and early 1970s the company pioneered Muesli manufacturing in Australia, working with Vitamin Supplies, another established and well-known Australian health food company.

By the early 1970s Soy Products of Australia employed more than 30 people and manufactured an extremely wide range of products. Unfortunately, many of these were labor intensive, and the company lacked the resources to finance the enormous capital investment required to automate them and to market them at a much larger scale. Other products, such as the herbs, were under increasing pressure from the medical profession and health departments, and were becoming increasingly difficult to market. With the enormous social and economic changes which have occurred in Australia since the mid-1970s, many of these products were no longer viable and, reluctantly and sadly, the Smiths had to scale down and lean up their operation. They had to concentrate on those products which they could manufacture and pack efficiently with their facilities.

On 28 Aug. 1973, F.G. Roberts was rebaptised into the Seventh-day Adventist (SDA) Church at the East Prahran Memorial Church (a suburb of Melbourne, Victoria) by J.B. Connolly and H.B. Christianson. F.G.R. and his wife were parishioners of the Windsor and East Prahran SDA churches and congregations.

At least four of the early soyfood products continued until the early 1974-74 under Ron Smith's direction: Beans in Tomato, Soy Bev, Soy Choc, and Soy Compound. In 1972, with the election of a labour government, labor and other costs soared. Most hand-made labour intensive products were discontinued at this time. The 2nd shift was discontinued and the number of permanent employees was reduced from 35 to 15, and have continued to decline ever since.

In 1974 the company F.G. Roberts' Health Foods Pty Ltd. ceased trading, following a rationalisation of the Smith family's affairs. The retail products and F.G. Roberts brand name were retained by "Soy Products of Australia Pty. Ltd." and continue to be manufactured by the company to this day (1995).

F.G. Roberts, a true pioneer in the fields of food, health, and naturopathy (natural healing) in Australia, died on 17 Nov. 1977, at "Corinella" Hospital, a Seventh-day Adventist (SDA) hospital adjacent to the SDA camp at Nunawading, an eastern suburb of Melbourne between Blackburn and Mitcham. Roberts was buried on 19 Oct. 1977 at Springvale, Cemetery.

His wife, Gladys, died less than a year later, on 12 July 1978, and was buried beside her husband at Springvale.

Roberts' daughter, Gladys, now (1995) resides at Corinella Retirement Village.

Was F.G. Roberts a vegetarian? Not strictly. Paul recalls: "He loved fish. A whole baked or grilled flounder was a favorite at home or dining out in Melbourne. He certainly enjoyed catching and eating the fresh Barrier Reef fish in Queensland. Roberts ate cheese, eggs and meat sparingly. In later life, as an antidote for a blood problem, he enjoyed a grilled steak on a weekly basis. Roberts favored vegetarianism. All his dietary advice advocated high consumption of fresh fruit, vegetables and wholegrain cereals, and sparing consumption of what he termed the 'concentrated' foods: meat, dairy products, eggs, nuts, fats, refined sugars." Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1390. Smith, Paul. 1995. History of Soy Products of Australia Pty. Ltd., and the work of Vincent R. "Ron" Smith. Part V. 1980-1995. Bayswater, Victoria, Australia. 6 p. Aug. Unpublished manuscript. Handwritten. Updated by several interviews with and letters to William Shurtleff in March 1995.

• ***Summary:*** In April 1980 Ron and Mabel Smith's eldest son, Paul, abandoned his career as an architect and joined them full time at Soy Products of Australia. Born on 23 January 1949 at Queens Road, South Melbourne, Paul had Architecture, Landscape Design, and Master of Business Administration (MBA) degrees. He had been a director of the company since Aug. 1977. In 1990 Paul became General Manager of the company following Mabel's retirement. In 1981, at the request of William Shurtleff of Soyfoods Center, Paul wrote a brief history of his company (which see). Thereafter, his interest in the company's history steadily grew, and he did extensive research on the subject. Paul is thinking about writing a biography of F.G. Roberts, so he has collected some documents about his life, including articles from *Nature's Path to Health,* published exercise regimes, iridiagnosis charts, and some recipe books. Unfortunately the company has no product catalogs from before 1985. Paul has written parts of the story and he has written an outline article in a 1985 company brochure.

Paul's human sources of information on F.G. Roberts were: His father and mother, Ron and Mabel Smith. Mrs. Gladys Hawken (F.G. Roberts' daughter). Mrs. Esmae Noelene Jackson (1937 -; née Grimes, granddaughter of F.G. Roberts and his wife Gladys; she was reared by both of them). Grahame Newitt (1939 -; chiropractor, grandson of F.G. Roberts, and brother of Esmae). Mr. David Evans, a naturopath who operated F.G. Roberts' clinics at Newcastle and Sydney during the 1930s. Mr. William Pruss, who worked with F.G. Roberts' brother, W.E. "Bill" Roberts in Sydney during the 1930s and 1940s. Nurse Cogan who operated F.G. Roberts' shop and clinic at Ballarat, Victoria, continuously from 1937 until her death in 1993. Numerous patients of F.G. Roberts, including Mr. Shugg (from Surrey Hills, a suburb of Melbourne), Nan Yates (diagnosed with terminal cancer in 1969 and still alive today), and Mrs. Alice Harding (diagnosed with cancer of the liver in 1939, who remarried at age 80 and died in 1987 at age 88).

The "Roberts" brand has been used continuously since F.G. Roberts commenced manufacturing in 1932 at 40a Chapel St., St. Kilda. The "Roberts" brand name applies to numerous other products, developed by Roberts in the 1930s, which have nothing to do with soybeans, e.g. "Molasses," "Alfalfa Tea," "Skin & Healing Ointment," "Vita Balm" (a heat rub), "Malted Bran," cider vinegar, etc., some of which we still manufacture and sell in addition to our soy products.

Apparently many of F.G. Roberts' personal papers and records were either dumped or acquired by Stephen (?) Newitt when Gladys Roberts Hawken sold her home to move into Corinella Retirement Village about 2 years ago. At least one complete set of *Nature's Path to Health* from July 1930 to Jan. 1947 still exists, privately owned, bound in five volumes.

Concerning old advertisements for products made by F.G. Roberts, Paul has original issues of *Nature's Path to Health* from 1935 (2 issues), 1936 (2 issues), and 1937, plus the April-May 1949 issue. He has seen later and earlier issues, and from some of these he has been able to photocopy articles and advertisements.

In the company's archives Paul can find no product labels or brochures which predate the move to Bayswater in 1968. All existing old labels have the Power Road, Bayswater, address, but many of them were copies of earlier labels with only the address changed. Some of the artwork goes back to the 1930s and early 1950s in format and design.

Even though F.G. Roberts was baptised a Seventh-day Adventist, attended an SDA college and married a woman who became a devout member of that church, he left the SDA church for many years during the middle of his life due to a mismatch between his views and the more conservative views held by the church and its elders at that time. There was intense competition between Roberts and Sanitarium Foods, owned by the SDA church. Roberts was a proponent of Norman Vincent Peale's "Power of positive thinking, and was very critical of Sanitarium Foods' use of wheat gluten in their meatlike products, nutmeats, etc. He also felt the SDA diet was too high in starch, sugar, and gluten. Ron Smith recalls that Roberts never discussed the matter with him.

Gladys, F.G.R.'s wife, remained a staunch SDA parishioner and member of the church throughout her life, paying out of her own income to send a number of children to SDA colleges in Australia and Fiji. F.G.R. upheld his wife in her religious beliefs and works, often waiting outside in the car while she and the children attended church. Yet F.G.R. was a very spiritual / religious person judging from the memories of those who knew him, and the tone of his magazine, *Nature's Path to Health*. His granddaughter, Esmae Jackson, was brought up in the Seventh-day Adventist religion and is still a devout, active member of the church. F.G.R. and his wife, Gladys, reared Esmae, due to friction between herself, her mother, and her stepfather. They paid Esmae's fees to attend the SDA college in Oxley Rd., Hawthorn (very near the 1954-1968 factory) and later Avondale College (SDA), where she studied to be a teacher. Esmae speaks very highly of the kindness and generosity of her grandparents for paying her school fees, etc. She apparently had a very happy and secure childhood with them. Paul suspects that F.G. Roberts felt that a religious background was not important to his work and it may have alienated some potential customers. He was widely known throughout Australia, and treated many SDA patients, including several people that Paul knows who formerly worked for the company.

Since 1957, Soy Products of Australia Pty. Ltd. has operated in two parts: One part is a flour milling / commodity type operation, producing heat-treated / stabilised / debittered products including Debittered Full Fat Soy Flour and Grits (the grits come in coarse and fine mesh), Lightly Steamed Full Fat Soy Flour, Heat Treated Soy Fibre Flour (from soy hulls), Stabilised Wheat Germ, and Stabilised Wheat Bran. They also produce heat treated wholegrain rice flour, and maize flour. The other part of the business produces specialty retail products under the Roberts' brand name for the health food, diabetic, and coeliac markets. This product range, remaining true to Roberts' philosophy of minimally processed whole foods, continues to include such soy-based foods as Soy Compound, Gluten Free Plain Flour, Gluten Free Self Raising Flour, Soy Crunch, and Vita Elm.

They also make some vegetarian burgers. In addition, since 1963, Soy Products of Australia has supplied cleaned and bagged Australian-grown soybeans to various commercial manufacturers of tofu, soy sauce, and other soyfoods in Australia. Since the early 1970s, most of these soybeans have been grown in the Riverina area in southern New South Wales and northern Victoria.

75% of the company's annual turnover relates in some way to soybeans. About 40% of their turnover is sold under the Roberts brand name and the remaining 60% is sold as commercial commodity products. They also do a fair amount of specialist contracting for the food industry, mainly stabilising bran and wheat germ, and milling, sieving, and mixing a variety of food stuffs for human consumption. They also process rice, maize, rye, barley, oats, wheat, and other grains for internal use. They are currently testing buckwheat, lupins, and chickpeas for both internal (i.e., under the Roberts brand) and external use. They propose to use them in conjunction with soy in a variety of applications. They are moving increasingly towards making user-friendly, convenience "health" or healthy foods which meet F.G. Roberts' ideals.

The company has 6 full-time employees and also employs a pool of casuals as required. The mill is highly automated, needing only a single operator. Last year's sales figures are confidential.

As of 1995 Paul Smith is involved in all aspects of the business, including building, plant and equipment selection, design, and development, product development, packaging design, information technology, etc.

V.R. "Ron" Smith is presently the Managing Director and major shareholder of the company; his wife and son Paul own the remaining shares. His main duties now revolve around maintenance and plant installation, with some consultative input on milling, sieving, and general product development. He no longer plays an active role in the day to day running and management of the company.

An excellent 4 by 6 inch black-and-white photo sent by Paul Smith shows F.G. Roberts, dressed in a coat, tie, and hat. Address: Director/General Manager, Soy Products of Australia Pty. Ltd., 69 Power Road, Bayswater, VIC 3153, Australia. Phone: (03) 729-1738 or 729-3611.

1391. *Soyafoods (ASA, Europe)*. 1995. A phytoestrogen story. 6(1):6. Spring.

• ***Summary:*** A "media scare story" concerning soya recently appeared in the British press. The story originated in New Zealand last year when a firm of consultants carried out some research on phytoestrogen levels in soy-based infant formulas. They concluded that the levels "were equivalent to giving several contraceptive pills a day" and submitted a report to the New Zealand authorities requesting the immediate withdrawal of soy-based infant formulas from the market. The story was reported in the New Zealand press.

When the story appeared in the UK, headlines questioned the safety of soy-based infant formulas and made comparisons with contraceptive pills. But the story failed to mention that "the research was commissioned privately by two New Zealanders concerned about side effects in their pet parrots who were being fed soya (not a proprietary bird feed!). Secondly, the research had not been published either independently or in a scientific journal and so it has not been peer-reviewed. The report, itself, is only available on payment of a substantial fee (£250)."

The New Zealand government and the New Zealand national association of health visitors both stated that there was insufficient evidence to warrant any action.

SoyaFoods concludes: "We don't yet know the role that phytoestrogens play in our diet, although studies on their health effects in adults are generally positive. Of course, where infants are concerned we need to be cautious, but we also need to keep a sense of proportion, after all millions of babies have been fed soya infant formulas over the past 20 to 30 years with no harmful effects."

1392. Smith, Paul; Smith, Ron. 1995. Re: History of early soybean production in Australia. Letter to William Shurtleff at Soyfoods Center, April 11. 5 p. Handwritten, without signature (fax).

• ***Summary:*** In 1851 we had goldrushes in Victoria at Ballarat and Bendigo. There were also goldfields before and after in New South Wales [at places like Hill End and Sofala], and goldmines at Beechworth in northeastern Victoria and a very large alluvial gold dredge at nearby El Dorado. All of these brought large numbers of Chinese to the area. In addition to gold mining, many of the Chinese turned their hands to market gardening. I have often wondered if they brought soybeans to Australia and tried to grow them. I have asked but have not been able to get an answer. There is a Chinese section to the cemetery at Beechworth.

Note: With the goldrushes came a huge influx of immigrants, the continent's population increasing threefold from 430,000 in 1851 to 1.7 million in 1871.

During the 1930s, F.G. Roberts and others were experimenting with soybean cultivation in Australia on a small home-garden and experimental level. An article in *Nature's Path to Health* (15 July 1936, p. 35-36) gives details. F.G. Roberts' first planted soya beans in his home garden on 1 May 1935. The four varieties (black, brown, green, and yellow) broke ground on May 15 and by the end of August had produced about 28 pounds of seed. A table gives detailed results. The black variety was the best producer, with a 56-fold increase of seed. The yellow variety gave poorest increase, 34-fold. Mrs. Drury also produced a "very prolific crop" in her garden at Murrumbeena; a sample was displayed at "Kalimna," Melbourne. Other gardeners, too, had equal success. Roberts concluded: "The Soya Bean has been very successfully grown in Australia."

But there were no commercial crops until the 1950s. In 1951, the first commercial crops were produced in Kingaroo, where Archie Kerr was the lead agronomist and, from the late 1940s, the farmers were particularly progressive and innovative. Ron Smith urged them on.

"In the late 1940s and early 1950s all soybeans [in Australia] were grown under dry; and farming techniques and were extremely vulnerable to dry Februarys. Yields were poor, often ½ to 3/4 ton/acre, if they bore any crop at all, until the advent of irrigation, which greatly improved both the yields and reliability of the crop."

In 1958, a huge irrigation scheme was developed at Coleambally, N.S.W., primarily to grow cotton. The cotton was not successful and the area is now used to grow rice, maize, sorghum, wheat, oats, barley, soy and mung beans.

In the early 1960s an American, Roy Eykamp, developed irrigation at Quirindi, N.S.W., tapping into the huge underground artesian basin.

The Pyle family at Berrigan, N.S.W., began growing experimental plots in the early 1960s. Likewise the Thomas family at Finley.

"It had taken nearly 10 years for soybeans to become an established, successful crop in Queensland. The same was to happen in New South Wales and its Riverina district. Time was needed for plant breeding programs to develop; for farmers to familiarize themselves with the crop and its insect and disease problems. it also took much longer to achieve realistic and stable prices in the Riverina–until the mid-1980s."

1393. Paine, Heather. 1995. Re: Concern with the safety of soy phytoestrogens in the United Kingdom. Letter to William Shurtleff at Soyfoods Center, April 12. 1 p. Typed, with signature on letterhead.

• ***Summary:*** This issue arose in New Zealand and was raised in the UK in January 1995 by a UK consumer advocacy group, the Food Commission (FC). They issued a press release and published an article on the subject in their magazine, *Living Earth & Food Magazine* (Jan/March, 1995, enclosed). The article refers to the original New Zealand report titled *The Toxicity of Soybeans and Related Products*, by R.F. James, V.A. James, D.J. Woodhams, and M.G. Fitzpatrick (Auckland 1994).

The UK Ministry of Agriculture, Fisheries, and Food (MAFF) is funding research into phytoestrogens, but that research has not yet started. Address: Editor, SoyaFoods, 27a Santos Rd., London, SW18 1NT, England. Phone: 081-874-5059.

1394. Roberts, Bonnie 1995. Re: The death of Horace Roberts. Letter to William Shurtleff at Soyfoods Center, April 26–in reply to inquiry. 1 p. Handwritten, with signature.

• ***Summary:*** Bonnie encloses the address of F.G. Roberts' "daughter in law, whose first husband, Horace, F.G.'s youngest son, died on the Burma-Thailand railway during World War II. She later married Tom McRae but was always very close to Fred & Gladys Roberts.

The address is: Mrs. Merle McCrae, 10 Godal Rd., Rosanna, VIC 3084, Australia. Address: "Abingdon," 220 Denholm's Road, Cambridge, Tasmania 7170, Australia.

1395. *Living Earth & Food Magazine (Food Commission, London).* 1995. New Zealand Health Ministry investigates soya baby milks. April/June. p. 3. [3 ref]
• ***Summary:*** The Food Commission is a UK consumer advocacy group. The New Zealand Health department has started an enquiry into the safety of soy-based infant formulas after a report indicated that the could contain dangerous high levels of phytoestrogens. "The Health Department has circulated a questionnaire to importers and manufacturers of soy-based products and asked scientists from around the world to contribute to the enquiry. It is anticipated that the matter may be referred to the World Health Organization for further investigation."

The UK government has been slow to respond to the matter. "In a letter to the Food Commission Baroness Cumberlege writes, The Committee (on Toxicity) considered that it was extremely difficult... to predict the actions of ingested phytoestrogens in humans... We agree that this is an area which requires further investigation."

1396. McCarthy, Paul. 1995. Dietary phytoestrogens: Scientists stalk potential soy chemopreventives. Research round-up. *Oncology Times (New York, NY).* April. p. 19-20.
• ***Summary:*** A good overview and summary, highlighting the work of leading researchers. According to biochemist Kenneth D.R. Setchell, PhD, investigations in this relatively new field began in his laboratory in the early 1980s. Dr. Setchell is Director of the Clinical Mass Spectrometry lab and Professor of Pediatrics at Children's Hospital Medical Center in Cincinnati, Ohio. He found equol, a phytoestrogen metabolite that is structurally similar to estradiol-17B, in human urine. He then determined that eating soy had the greatest effect on equol levels: 40 gm/day of soy protein made equol levels in the blood and urine jump 5,000 times above baseline.

This led him to measure phytoestrogen levels in Asians; he found their levels to be very high. Since weak estrogens have both estrogenic and anti-estrogenic effects, he hypothesized that soy might have properties similar to tamoxifen (a drug which is widely used in the successful treatment of hormone-dependent breast cancer in humans) and that a diet high in soy might explain the lower rates of breast and prostate cancers in Asia. Several key experiments conducted by Setchell, Dr. Stephen Barnes, and others, previously published in scientific journals, are then described.

The results have been provocative, but the mechanism behind the anticancer actions of soy remains unclear. Dr. Setchell is not convinced that it is as simple as his 1984 hypothesis, that the phytoestrogens in soy act like tamoxifen. Since then it has become clear that phytoestrogens also act as antioxidants. Moreover, genistein is a potent inhibitor of protein kinases, the key enzymes involved in the regulation of the phosphorylation of cells.

Herman Adlercreutz, M.D., PhD, of the University of Helsinki in Finland, has studied the anticancer role of soy in prostate cancer and is interested in the mechanism. Soy's estrogenic properties might suppress the growth of prostate tumors. This makes sense because prostate cancer is treated with estrogen. Dr. Adlercreutz has shown that genistein is one of the strongest known natural inhibitors of angiogenesis; it helps to cut off the blood supply that tumors need to grow. Alternatively, soy can suppress the production of gonadotropin secretions by the hypothalmus. This may cause a secondary decrease in testosterone production, which may be reflected in the lower levels found in Japanese men. And lifelong lower testosterone levels may postpone the development of prostate cancer.

Dr. Barnes has observed that prostate-specific antigen (PSA) values fall sharply in men with prostate cancer after that start a soy regimen. So he has started a systematic investigation of PSA values and other bio-markers of prostate cancer to determine if they can be favorably altered by soy.

Some researchers believe that soy could substitute for estrogen-replacement therapy (ERT). Barry R. Goldin of Tufts University School of Medicine notes that a Japanese woman on a traditional high soy diet (about 55 gm/day) is getting the daily equivalent of a low dose of Premarin. Already Dr. Adlercreutz and Mark Whalqvist, MD, Chairman of the Department of Medicine at Monash University in Melbourne, Australia, offer a soy alternative to women who are reluctant to take ERT.

Dr. Margo N. Woods at Tufts is now conducting a study on soy and breast cancer in a group of 200 women. She will be studying levels of serum hormones, luteinizing hormones (LH), and follicle-stimulating hormones (FSH), and trying to correlate them with diary recorded hot flashes and night sweats.

No one knows if consuming large amounts of soy could prove harmful to humans; soy researchers typically respond that the Chinese and Japanese have no apparent problems. But fertility specialist Claude L. Hughes, Jr., PhD, MD, raises important questions. Associate Professor of Comparative Medicine and Obstetrics & Gynecology at Bowman-Gray School of Medicine of Wake Forest University (Winston-Salem, North Carolina), Hughes urges researchers to look at both risks and benefits, especially for humans and other animals in their early developmental stages. He "said he wouldn't be comfortable with his pregnant wife eating large amounts of soy. Nor would he want to expose a neonate [an infant less than 4 weeks old] to soy-based formula." Dr. Hughes sees puberty as another opportunity for research. He is feeding soy to peripubertal male and female monkeys to see if it "perturbs the events of puberty from a reproductive/endocrine point of view."

"After puberty, except when a woman is trying to conceive, he said he expects that soy will prove to be a good addition to Western diets and possibly chemopreventive for breast and prostate cancers."

Photos show Dr. Kenneth D.R. Setchell, Dr. Margo N. Woods, and Dr. Claude L. Hughes.

1397. Smith, Paul. 1995. Re: F.G. Roberts and soy in Australia. Letter to William Shurtleff at Soyfoods Center, May 5. 4 p. Typed, with signature.

• ***Summary:*** Gives details on the history of *Nature's Path to Health*. Includes a 2-page handwritten genealogy (family tree) of the descendants of F.G. Roberts and Gladys Maude Griffiths; they had 3 children and many grandchildren and great-grandchildren.

"For me this exercise has been invaluable in enabling me to put my fathers' and my own lifetime's interest in soy into perspective. To satisfy my curiosity in discovering how, why, when, and where it all started and how it has progressed since: to provide a totally coherent picture of the whole process. While there is no denying F.G. Roberts' pioneering contribution and the importance of his influence upon my father, Roberts' contribution pales into insignificance in comparison to the current work in plant hormones, isoflavonoids, fermented flours and the numerous soy food products on the [SPA] drawing board and in development.

"From the time of my father's involvement in the business F.G. Roberts became increasingly preoccupied with the Australian School of Naturopathy with increasingly heavy administrative, daytime and evening teaching commitments. From the split in 1954 onwards, Roberts became increasingly distanced from the food development and manufacturing business he had started or taken over in mid-1936. By the mid-1950s Roberts was in his early sixties; his career had taken a new and unrelated path and he was probably busier than he had ever been in his life. The drift away from publishing *Nature's Path to Health* and the health food business was inevitable. One door had closed and another opened. Roberts and his wife both continued working right up until a few months before their respective deaths in 1977 and 1978. The establishment of the Australian School of Naturopathy and his teaching work there were probably F.G. Roberts' greatest and most enduring accomplishments."

1398. Hanrahan, Sarah. 1995. Taken seriously (Letter to the editor). *New Zealand Herald*. May 6.

• ***Summary:*** "Sir,–When the claim that soya infant formula might be unsafe was first brought to our attention we thoroughly researched and investigated the issue. As part of this we consulted widely with bodies including the Ministry of Health and Plunket, as well as reviewing international research available on the subject.

"Human studies on the effects of phyto-oestrogens have so far only showed beneficial effects. Worldwide we have found no evidence of any harmful effect. The claims of possible harm are based on conjecture, not scientific evidence." Address: Dietitian, Douglas Nutrition (Food and Drug Co.).

1399. Sheehan, Daniel M. 1995. Re: Exchange of information on phytoestrogens. Letter (fax) to Dr. Mike Fitzpatrick of New Zealand, May 8. 1 p. Typed, without signature.

• ***Summary:*** This letter shows that by May 1995 Daniel Sheehan was in contact with researchers in New Zealand on the subject of soy phytoestrogens. Address: Dep. of Health and Human Services, Food and Drug Administration, National Center for Toxicological Research, Div. of Reproductive and Developmental Toxicology, Jefferson, Arkansas 72079-9502, and Dep. of Biochemistry, Univ. of Arkansas for Medical Sciences, Little Rock, AR 72205. Phone: 501-543-7561; fax 501-543-7682.

1400. Phelan, Amanda. 1995. The soya dilemma. *The Northern Herald (Sydney, Australia)* p. 1, 7. May 18.

• ***Summary:*** The writer believes "there is strong evidence that soya beans may be dangerous." However Dr. Graham Kelly, a scientist and soy expert from North Sydney, believes that soy products have major health benefits "and can prevent a number of cancers, including those of the breast, prostate, and colon."

1401. Irvine, Cliff; Fitzpatrick, Mike; Robertson, Iain; Woodhams, David. 1995. The potential adverse effects of soybean phytoestrogens in infant feeding (Letter to the editor). *New Zealand Medical Journal* 108(1000):208-09. May 24. [10 ref]

• ***Summary:*** This letter (with 10 references) is a call, by experts in the field, to ban soy-based infant formula in New Zealand.

1402. Roberts, Rosemary. 1995. Leading scientist backs call to ban soy baby food. *Northern Advocate (Whangarei, New Zealand)*. May 25.

• ***Summary:*** "One of New Zealand's foremost scientists has thrown his weight behind a campaign to halt sales of soybean-based infant formulas.

"In a letter published in the *New Zealand Medical Journal* today, Professor Cliff Irvine, of Lincoln University, has joined three fellow scientists in calling for general sales of soy-based infant formulas to be stopped.

"The letter reopens the debate over the content of soy-based infant formulas."

"In today's issue of the Medical Journal, Mr. Irvine, who holds three doctorates, Iain Robertson, PhD, toxicologist at the Auckland University Medical School, David Woodhams, PhD, a food process consultant, and Mike Fitzpatrick, PhD, the environmental consultant who produced the James' report, have called on the Ministry of Health to stop sales. But despite their concerns the Ministry, which has been gathering information on the subject, says all soy products, including infant formulas, will stay on the market."

This article also appears in *Daily Post* 25 May, *Gisborne Herald* 26 May, *The Dominion* 26 May, *Sunday Times* 6 Jul.

1403. NZPA. 1995. Scientists warn of soya baby milk risks. *Dominion (The).* May 26.
• ***Summary:*** This article also appears in *Sunday Times* 6 July. Address: Whangarei.

1404. Lazzaro, Don. 1995. New developments with soymilk in Australia (Interview). *SoyaScan Notes.* May 29. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Pureharvest has, for some time, been buying its soymilk from Australian Natural Foods (ANF), but recently the quality of this soymilk has been very inconsistent, and often unacceptable. Berryvale Orchards is Australia's largest manufacturer of fruit juices–a huge company. In about 1988-89, after Sanitarium Foods launched So Good, a small distributor in Victoria approached Berryvale and offered to sell them the technology and know how to make soymilk from whole soybeans. Unfortunately this little fellow didn't know how to make soymilk, so Berryvale's initial products were of very poor quality. Recently they have installed a rather low-cost soymilk plant and Don has switched to using them as his source of soymilk. But the quality is still not as good as he would like. Address: Pureharvest, 15 Ardena Ct., East Bentleigh, Victoria 3166 Melbourne, Australia.

1405. Clayton, Victoria. 1995. Soy milk formula may harm infants. *Australian Doctor.* About May 30. Back page.
• ***Summary:*** A Sydney pediatrician, Dr. Patricia McVeagh, a VMO at the Children's Hospital, Camperdown [New South Wales, Australia] has warned that soy formulas may be harmful to infants–"after New Zealand researchers [such as Professor Cliff Irvine] reported that soy formulas contained high levels of the potentially harmful phytoestrogens daidzein and genistein."

"Dr. McVeagh said infant formula sales indicated about 12% of Australian formula-fed infants were on soy products, although few needed them." Address: Dr.

1406. *SoyaScan Notes.* 1995. Dr. Chungs Food Co. Ltd. USA (Overview). May 30. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** In the '94 Soya Bluebook is a listing for this famous Korean soymilk manufacturer at 960 Massachusetts Ave., Boston, Massachusetts 02118. Phone: 617-427-1507. Contact Rob Martel, Sales Manager. They may be planning to make soymilk in North America and it is said that they have a co-packing contract with Pacific Foods of Oregon. They are now constructing a soymilk plant in Australia.

1407. *Bluebook Update (Bar Harbor, Maine).* 1995. Soya toxicity issue develops downunder. 2(2):1, 4. April/June. [1 ref]
• ***Summary:*** Mike Fitzpatrick, an independent researcher from Auckland, has given information on the toxicity of soybeans to the New Zealand Ministry of Health. The Ministry's chief toxicologist, Martin Edwards, is report to be "keen to hear of any information to help us and the international community reach a decision" on the risk of phytoestrogens in soy products.

According to Dr. Mark Messina, a specialist in the area of soya phytoestrogens, a dietary practice group of the American Dietetic Association [see Gunderson 1994] has recommended that women attempting to become pregnant refrain from consuming soy products. Messina adds that "There is not one human study demonstrating any kind of toxicity in response to soy consumption, and people have been eating soyfoods in the U.S. for decades, and in Asia for hundreds of years."

1408. Roberts, Rosemary. 1995. Soy products off kakapo feed list: Conservation, health officials heed Whangarei word. *Northern Advocate (Whangarei, New Zealand).* June 5. p. 1.
• ***Summary:*** Information from a Whangarei couple, Dick and Valerie James, has prompted the Department of Conservation breeding programmes to stop feeding soy-based products to kakapo–a rare and beautiful bird. In addition, the use of tofu, a soy product, as a kakapo feed was also discontinued last year "due to general uncertainty."

1409. Lazzaro, Don. 1995. History and current status of soymilk in Australia (Interview). *SoyaScan Notes.* June 6. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ceres Natural Foods is their holding company and Pureharvest is their trading name. They made this name change in 1982 since they found the word Ceres was difficult for many people to pronounce. The first soymilk they imported to Australia was made by Saniku in Japan and imported from Mitoku.

Don is interested in macrobiotics. In early 1979 he took over the running of a small macrobiotic and natural foods retail store in Melbourne named Ceres Wholefoods. The only way he could make it viable was to try to buy at better prices, so in April 1979 he started a wholesale and import company, which he named Ceres Natural Foods, also in Melbourne. There was a company named Real Foods (run by Michael Pels) in New South Wales, Australia, that was importing, through Mitoku in Japan, tamari, soy sauce, miso, tofu, etc. Real Foods was the first company in Australia to import foods from Mitoku in Japan.

Don knew Michael from when they both used to live in Sydney in about 1978. Michael purchased some rice cake machines (the same kind used by Chico-san) through Mitoku from Airin Co. These machines were very poorly engineered and constructed. Michael has already sold 168 of these machines to Quaker.

When Don took over the Ceres Wholefoods retail store in 1979, he approached Michael and asked to be the distributor in Victoria of the food products Michael was importing from Japan through Mitoku. Michael said okay, and Don began distributing. Don asked Michael to import some soymilk from Mitoku, which he did in mid-1980. The stick-on label over the Japanese label said Ceres Natural, in Choc-Malt and Natural flavors. But the first soymilk in Australia was imported from Japan in about 1977-78, through Muso by 3-4 health food stores named Russel's; it was made by Marusan in a stand-up plastic pouch. Not much of it was sold. In about 1980-81, Michael decided to get out of the whole import business in order to focus on making rice cakes. So Mitoku Mr. Kazama and Chris Dawson asked Don to become their importer in Australia. Don also ran a 3rd company, a center that provided information and advice on macrobiotics.

Jim Wilson, who was running Spiral Foods in Australia, had been importing from Mitoku. He convinced Mitoku not to sell to Don, his competitor; Mitoku agreed. Mitoku then approached Saniku, and in about 1981 Don began importing soy milk made by Saniku through Mitoku. Don sold it under the same label he had used before. The Muso started to import some soymilk packaged in Tetra Brik cartons through Spiral Foods. Don got the same product from Kibun, and on it began to use the name Pureharvest.

In short: Four companies pioneered in importing soymilk to Australia: Real Foods, Russel's, Spiral Foods, and Ceres Natural Foods. There was also a little relatively beany Chinese soymilk sold in the ethnic Chinese market. Ceres, as a result of its Tetra Brik package, managed to get fairly good distribution into the grocery / supermarket trade, starting in late 1983 or early 1984. By this time Ceres was by far the biggest seller of soymilk in Australia. They were importing five 20-foot containers per month of the Kibun soymilk product. Ceres was actively promoting this soymilk, doing trade shows, etc.

In 1986 Ceres was approached by a small soymilk maker named Australian Natural Foods (ANF) in Sydney; basically they had old machinery and were in trouble. They approached Don asking if they could make a soymilk for him. They worked out an exclusive deal and formula, and in Nov. 1986 Ceres launched this as Aussie Soy in its first 1 liter package, in Tetra Brik. Sales shot up. It was trucked in a dairy tanker to Bon Lait in Victoria (almost 1,000 miles away) where it was packaged in a dairy that had a Tetra Brick packaging machine. In about 1990-91 ANF first got its own Tetra Brik packaging machine. That same year ANF launched its own soymilk product, named So Natural, to compete with Sanitarium's So Good. It is made from whole soybeans, and is very similar to the Aussie Soy product they have long made for Don.

As early as 1980 Sanitarium Foods was importing Soyalac in tins / cans. They sold it mostly to Seventh-day Adventists through their own retail stores. Then in April 1987 Sanitarium Foods launched their own So Good soymilk (made from a blend of soy protein isolates, made and packaged by dairy companies) in Australia. They went into it in a big way, with a national campaign. It was the best thing that ever happened to Don and Ceres, because this campaign grew the market dramatically. By April 1987 Ceres was selling 10,000 cartons / month of their Aussie Soy, not including their Japan imports. One year later the figure had skyrocketed to 60,000 cartons / month, increasing to 152,000 on year after that.

Nevertheless, according to the *Australian Grocery Industry Marketing Guide* (1995), Sanitarium has 71% of the dairylike (unflavored) Australian soymilk market, followed by Vitasoy at 7% (they launched in about 1991, and have done a very aggressive marketing campaign), then So Natural (made by ANF) at 5%, Sun Gold at 5%, and Aussie Soy at 4-5%. Of the total Australian soymilk market, flavored soymilks account for only about 5% of the total; the remaining 95% is dairylike; its a milk alternatives market. Each of the three major supermarket chains in Australia (Woolworth's Safeway, Franklin's, and Cole's) has its own soymilk brand. Franklin's has an isolate soymilk made by ANF, starting about a year ago. Sun Gold, made by Associated Dairies of New South Wales, is almost identical to So Good, made by the dairy company that used to mix Sanitarium's product. In about 1990 Sanitarium set up their own soymilk mixing and packaging factory.

Today the soymilk retail market in Australia is $45 million, with a population of only 17 million people. This is huge on a per capita basis. This market has three main segments: (1) Middle class, educated, with some allergies–70%. (2) Age 50 and older, concerned with cholesterol–20%. (3) Natural foods and vegetarian–10%.

In late 1993 and early 1994 Don approached Berrivale Orchard Ltd. (a cooperative of fruit growers, headquarters in Berri, South Australia) to see if they would be interested in making a soymilk product for Ceres / Pureharvest–because Don's relationship with ANF had become intolerable.

In 1979, to get tofu to sell at his retail store, Don used to go to Chinatown in Melbourne twice a week. He bought it from a little Chinese company (whose name he does not remember) located opposite Victoria Market. He would take a couple of buckets and carry it home in bulk, under water. Address: Pureharvest, 15 Ardena Ct., East Bentleigh, Victoria 3166 Melbourne, Australia.

1410. *Manawatu Evening Standard.* 1995. Couple praised for soy feed research. June 8.

• ***Summary:*** Whangarei–Research by a Whangarei couple has ended the feeding of soy-based products to kakapo in the Department of Conservation's breeding programmes.

"Conservation Minister Denis Marshall told Dick and Valerie James last week that thanks to information they'd given DOC in 1994 supplementary feed containing soy was no longer being fed to the birds.

"He thought all other protected species in the department's avicultural activities were also off such products.

"The couple claim some modern commercial processing of soy leaves biologically active levels of toxins.

"They reached this conclusion after commissioning thousands of dollars worth of research and analysis in New Zealand and overseas to determine the causes of the premature maturation and death of many of their own exotic birds." A large portrait photo shows Denis Marshall.

1411. Erlichman, James. 1995. Infants' oestrogen overdose. *Guardian (London).* June 14.

1412. Guy, Camille. 1995. Soy under suspicion: Natural toxins in soybeans could be putting our health at risk. *New Zealand Herald.* June 24. Section 8. p. 2.

• ***Summary:*** "At Whangarei Heads a retired couple keep hundreds of dead parrots in a freezer. The prized chicks were hand-reared on a commercial bird feed derived from the much touted 'health food' soybean.

"Bird-breeders Richard and Valerie James are preserving the birds because they believe they were poisoned. You could dismiss them as cranks, except that the American Food and Drug Administration is now showing serious interest in the contents of the makeshift morgue.

"The couple who once nurtured 600 breeding birds of 40 different species now discount their personal losses. They found the implications of the parrot deaths so serious they went into debt to have them investigated.

"After two years' work at an estimated cost of $354,000, the Jameses and four New Zealand scientists now believe the parrot deaths were probably due to natural toxins in soybeans."

"The Whangarei couple's parrot problems began in 1992 when chicks, fed exclusively on a soy-based product died in ways consistent with eating rat poison. The birds haemorrhaged violently from the beak and suffered total collapse of their internal organs. Survivors suffered deformities, were infertile, or laid deformed eggs.

"Dick James, a New Zealand-born lawyer with a masters degree in business administration from California, was determined to establish why his birds died. Autopsies carried out at Massey University suggested the deaths were due to severe depression of the birds' immune systems."

"At no stage would any Government body contribute to the cost of this work. In 1994 New Zealand imported nearly 350,000 kg of soybeans, 18 million kg of soy flour, and 18 million litres of soybean oil. One seller of soy products, Healtheries of New Zealand Ltd., did help with the cost of the Fitzpatrick analyses. The company's technical manager, Robert Shaw, gave assistance, including getting Healtheries to commission Auckland Medical School senior toxicologist Dr. Iain Robertson to do an independent review of the Fitzpatrick report.

"The review, dated October 1994, was succinct and forthright. Dr Robertson found the Fitzpatrick report 'detailed and reasoned' and made eight recommendations. The first was that the use of soybean products in infant formula be discontinued. 'I can see no good reason why anyone would wish to continue with general sales of such products. Infants are a high-risk population.' Interfering with the many hormone-driven processes going on in infants could affect their growth or immunity, or put them at risk of cancer, Dr Robertson said.

"Healtheries does not produce a soy infant formula but the pharmaceutical company Wyeth does. Its Sydney-based [in Australia] marketing director, Dr Gregory Rough, told the *New Zealand Herald* that he believes the New Zealand reports are speculative and scientifically flawed. Dr Rough was unable to name any scientist not connected to the soy industry who could dispute them," but pointed to millions of babies using soy formula for 15-20 years without reports of adverse effects. "Dr Rough agrees there have been no long term studies but says Asians are exposed to a high level of phytoestrogens without problems."

Photos show: (1) Richard and Valerie James with a large white bird in one of their aviaries. The caption: "Richard and Valerie James are on a personal crusade to expose the dangers of soybeans." (2) Three dead parrots stores in the Jameses' freezer. The caption notes that they "are thought to have died as a result of eating feed containing soybean."

This article also appeared in *Christchurch Press* 25 Jan. 1996.

1413. Guy, Camille. 1995. Plunket to test soy products. *New Zealand Herald.* June 24.

• ***Summary:*** "The Plunket Society is planning a $40,000 study to see whether soy baby formula contains toxic substances.

"According to documents obtained under the Official Information Act, Plunket plans to measure potentially toxic plant estrogens called phytoestrogens in the urine of 80 babies fed on soy formula."

1414. Brittenden, Wayne. 1995. A New Zealand report on the possible dangers of soya milk has raised fears in Britain: Report suggests that the milk contains high levels of hormones. Radio New Zealand News, NZBC London correspondent. 12:30 PM News Tuesday, 20, June 1995.

1415. Roberts, Rosemary. 1995. Whangarei soy researchers inundated. *Northern Advocate (Whangarei, New Zealand).* July 1.
• ***Summary:*** "Interest is mounting in a Whangarei couple whose investigations have led to recommendations that soy-based infant formula be banned. Dick and Valerie James carried out the investigations–and paid for them themselves–during the past two years after exotic birds they owned died."

Last year. they went public with their story through the *Northern Advocate.* An Auckland newspaper published a feature story on their work last weekend–so interest continues to grow.

1416. Guy, Camille. 1995. Growth disorders reopen soy debate: Parents who fed their babies soy formula are asking questions about growth problems the children are now suffering. *New Zealand Herald–Weekend Magazine.* Aug. 26. Section 8. p. 6. Saturday.
• ***Summary:*** 11 weeks, mother's milk was supplemented with soy formula, which Sarah continued to drink until she was 5.

"Sarah's childhood was not an easy ride. At 18 months she broke her femur. She was troubled by eczema and asthma.

"More puzzling was the way Sarah's face developed an abnormal flush at about six months. Later dark rings formed under her eyes.

"Sarah's parents took comfort from their daughter's growth rate, which was just fine. But at 12 Sarah suddenly stopped growing–except for her breasts. She is now seeking breast-reduction surgery.

"Sarah's bones sometimes ache and are easily dislocated. She has had abnormal hair growth, and recently hair loss.

"Sarah's periods have never been regular and she has endured prolonged bleeding. She is under specialist medical care, but doctors can offer no satisfactory explanation for Sarah's disorders.

"Sarah's mother felt driven to tell her daughter's story when she read a *New Zealand Herald* feature article in June on natural toxins in soybeans. ["Soybean campaigner turns up the heat," June 15]. We reported that four New Zealand scientists have persistently urged our Ministry of Health to stop general sales of soy infant formula.

"Professor Cliff Irvine, Dr Mike Fitzpatrick, Dr David Woodhams and Dr Iain Robertson all believe scientific understandings about the toxins particularly the phytoestrogens (isoflavones), found in soy products, and especially in soy infant formula, indicate possible long-term ill-effects.

"But the ministry is reluctant to act until 'researchers give us a more definitive steer.' And the soy industry continues to express confidence in its products. In the *Herald* article, Dr. Gregory Rough of the Wyeth pharmaceutical company said that babies had used soy formula for 25 years without adverse reports.

"The comment prompted several *Herald* readers to offer their own stories. They say they fed their babies soy formula, back in the days when that was unusual–one couple even importing the product by the case-load because it was not locally available.

Those soy-fed children are now teens or adults, and their parents voice concerns about their development. Those with sons report hyperactivity, learning difficulties, limited concentration and genital abnormalities. One mother says her son became extremely self-conscious about his pointed nipples.

"Parents with daughters speak of arrested development, learning difficulties, delayed puberty, bleeding disorders, ovary disorders, and difficulties with brittle bones, yellowed teeth and retention of baby teeth. One woman developed one breast two years before the other one grew.

"Nobody claims that soy caused these problems. The long-term studies to determine whether there could be any connection have not been done. But the parents the *Herald* spoke to are so struck by the resemblance between reported isoflavone effects on animals, and the disorders they are noticing in their children, that they are asking for urgent investigation. They want to rule out the possibility that feeding their babies soy formula contributed to their present problems."

A nutrition conference will be held at the Auckland University Medical School next week. Some eminent overseas scientists (including Dr. Kenneth Setchell from Cincinnati [Ohio], and Dr. Patricia Whitten from Emory University in Georgia) plan to attend the session on phytoestrogens.

1417. Woodhams, David J. 1995. Phytoestrogens and parrots: Anatomy of an investigation. *Proceedings of the Nutrition Society of New Zealand* 20:22-31. Paper presented Aug. 29. [14 ref]
• ***Summary:*** In Dec. 1991 aviculturists Richard and Valerie James (of McLeod Bay, Whangarei, New Zealand) began to feed soy-based feeds to their adult parrots. The birds looked particularly healthy during the first few months, appearing

shiny and fat and breeding well. Later in the breeding season, James observed crippled feet, stunting and premature coloration in immature birds. Between January 1992 and the end of May 1993, 1272 infertile eggs were found, and 542 chicks and 289 adult birds were lost. Address: PhD, Dairy Process Consultant, 2/47 Church St., Devonport 1309, New Zealand.

1418. Guy, Camille. 1995. Nutrition experts argue over possible risks or benefits of feeding infants soy formula. *New Zealand Herald.* Aug. 30.
• ***Summary:*** At the joint Australia and New Zealand nutrition conference being held at the Auckland Medical School this weekend, nutrition scientists failed to agree on the possible risks of feeding babies soy infant formula.

Dr. Ian Robertson, a senior lecturer in toxicology at the school, "told the conference that he believed the 800 to 1,600 New Zealand babies put on soy formula each year receive three to six times the dose of phytoestrogens shown to lengthen the menstrual cycles of women consuming a small amount of soy food."

1419. Birkbeck, John. 1995. Soy formulas (Letter to the editor). *Pharmacy Today (Auckland, New Zealand).* Aug.

1420. Dinsdale, Mike. 1995. U.S. expert urges research on soy baby food risk. *Northern Advocate (Whangarei, New Zealand).* Sept. 6.
• ***Summary:*** Prof. Pat Whitten, an American reproductive expert, visited Whangarei couple Valerie and Richard James this week while in New Zealand for a symposium on the reproductive and developmental actions of dietary phytoestrogens. Ms. Whitten is from the reproductive ecology and environmental toxicology department of anthropology at Emory University in Atlanta, Georgia, USA. She noted that the levels of phytoestrogens in soy infant formulae are three to four times higher than what an adult would consume in soybeans–and that needs to be explored, ideally by an independent and impartial government-run inquiry. A photo shows Pat Whitten.

1421. Fleming, Donna. 1995. What are you feeding your baby? NZ health scandal. *New Zealand Woman's Weekly.* Sept. 11. p. 22-23. [1 ref]
• ***Summary:*** Tells the sad stories of three young women (Jenny, Sarah, and Denise) who were raised on soy-based infant formulae and later suffered serious health problems.

Much of the information in this article was published previously in "Growth disorders reopen soy debate," by Camille Guy (*New Zealand Herald–Weekend Magazine,* Aug. 26. Section 8, p. 6. Sat.).

1422. Johnston, Trevor. 1995. Soyfood manufacturer defends the safety of such products (Letter to the editor). *New Zealand Herald–Weekend Magazine.* Sept. 13.
• ***Summary:*** This letter to the editor begins: "Sir,–Regarding your recent *Weekend Magazine* article 'Growth disorders reopen soy debate,' I am an owner of a local soyfood manufacturer. I myself consume soyfoods regularly, as do many of my friends and family. It deeply concerns me that many people who have found soyfood to be a real ally in meeting their special dietary or ethical needs may now be questioning their earlier confidence.

"The public should be aware that not one of the four New Zealand scientists who have expressed concerns in the media is a nutritionist. Leading nutritionists and bodies charged with promoting public health in New Zealand, such as the Plunket Society, the Nutrition Foundation and the Ministry of Health, all continue to endorse the safety of soy foods."

The newspaper responds: "The New Zealand scientists who have expressed concern are an analytical chemist, a toxicologist, and endocrinologist and a food scientist. The Plunket Society is revising its advice to health professionals on soy formula; its latest draft concludes that since 'concerns have been raised about the safety of certain natural components of the milk, research is being undertaken into the effect of these compounds on infants, but it will be some time before a clear picture is available.'" Address: Marketing director, Bean Supreme Ltd., Soyfood Manufacturer.

1423. Tasman-Jones, C. 1995. Birds are not of the same feather as humans (Letter to the editor). *New Zealand Herald.* Sept. 16.
• ***Summary:*** "The basis of the soy debate is the observation that one parrot feeder suffered serious premature death of many of his valuable birds when they were fed soy-based pellets. This observation is important, especially for parrot breeders.

"There were attempts to determine whether infection was the causative factor. As this was negative, it was assumed that the deaths were due to oestrogen-like substances in soy... This theory must be confirmed. It may be just as wrong as the initial suspicion of infection. If correct, it has important implications...

"The extrapolation of the assumption to humans is dangerous. On the unproven hypothesis that soy oestrogen-like substances caused the illness and death in parrots, a theoretical calculation has been done to suggest that soy-based infant formulas may be harmful.

"Infants come from a high-oestrogen environment and soy products have been widely used, particularly in the Asian areas, and yet there are no reports suggesting that adverse health effects have occurred..." Address: Prof. [of Gastroenterology], St. Heliers (suburb of Auckland City), New Zealand.

1424. *Soya Bluebook Plus.* 1995-1997. Serial/periodical. Bar Harbor, Maine: Soyatech, Inc. Peter Golbitz, publisher and editor. Frequency: Annual.

• ***Summary:*** Preceded by Soya Bluebook. A directory and information book for the soybean processing and production industries. One of the most valuable sources of worldwide information on soybeans. The first issue (shipped Sept. 1995) is titled "Soya Bluebook Plus: the annual directory of the world oilseed industry." Crops featured on the front cover are "soya, corn, cottonseed, palm, canola, rapeseed, and sunflower." Contents (most sections are marked with a fold-out tab): Organizations and government agencies: White pages, yellow pages. Oilseed product processors and marketers. Equipment supplies and services. Oilseed statistics. Oilseed reference: Oilseed glossary, standards and specifications, oilseed technical charts and tables. Indexes: Comprehensive index, advertiser index.

Concerning the year: The edition published in mid-1994 was titled '94 Soya Bluebook. The edition published in mid-1995 was titled '95-96 Soya Bluebook. The edition published in Sept. 1996 (the 50th edition) was titled '97 Soya Bluebook. The change was made to give the company extra time (16 months) to market the latest edition before the next year arrived. Address: 318 Main St., P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

1425. Tuohy, Pat. 1995. Plunket advice (Letter to the editor). *New Zealand Herald.* Sept. 25.

• ***Summary:*** "Sir,–It would be incorrect to say that the Plunket Society endorses the safety of soy infant formula. Our official position is that there is no evidence that the product is harmful to babies, but we do not endorse its use.

"We recommend breast feeding where possible, and a cows-milk based infant formula as the primary alternative." Address: Dr., FRACP, Director of policy, Plunket medical doctor.

1426. Fitzpatrick, Mike. 1995. Soy warning (Letter to the editor). *New Zealand Herald.* Aug. or Sept. 12 or 21.

• ***Summary:*** "Sir,–It is unfortunate that concerns about soy formulas have had a negative impact on companies, such as Bean Supreme, that do not market infant foods. On this issue the Ministry of Health, via Dr Martin Edwards has stated it does not want to 'unduly damage an industry.' But which is the greater tragedy: a loss of confidence in soy products or a potential health risk to babies."

"The conclusion reached was no leap of logic; compounds that are proven hormone disrupters in adult women (not parrots, quail, fish, dogs, cats, cows, pigs, rats, mice or cheetahs–all of which incidentally, suffer hormone-related disorders when exposed to dietary soy phytoestrogens) are present in significant quantities in soy formulas." Address: PhD, Mt. Eden, analytical chemist.

1427. Pemble, Louise. 1995. Jury is still out on side effects of soy formula. *New Zealand Doctor.* Sept.

• ***Summary:*** At a joint Australian and New Zealand science meeting, experts failed to agree on the risks of infant soy formulas. Visiting American nutrition expert Mark Messina, who was present, was not invited to speak despite his credentials as "a leading authority on soyfoods and cancer prevention." When he asked the panel why no studies have ever reported any adverse effects of soy consumption in humans, other speakers countered that no extensive studies of humans have ever been conducted.

Ian Robertson, senior lecturer in toxicology at the Auckland School of Medicine, advised parents to avoid soy formulas, even though no risk had been proven–because there is no evidence of their safety. He said that the risk is potential but avoidable, so why take it?

A sidebar titled "Soy advocates push hormone advantages" discusses the views of Dr. Mark Messina, who led a panel of nutrition experts in Auckland. Messina was former program director at the Diet and Cancer Branch of the U.S. National Cancer Institute. He conducted his doctoral research on the effects of cruciferous vegetables on colon cancer. He noted that in the USA soy is widely regarded as a health food, in contrast to New Zealand where it is now given negative coverage.

1428. Messina, Mark. 1995. Soy formula safety (Letter to the editor). *New Zealand Herald.* Oct. 15.

• ***Summary:*** "In his letter on the safety of soy formula, Dr. Fitzpatrick pointed out that manufacturers have long known their products contain phytoestrogens, yet studies involving infants and phytoestrogens have not been conducted. These statements are true but irrelevant.

"The issue is not the effects of the phytoestrogens but the effects of soy formula. In this regard, countless numbers of studies have been conducted during the past several decades and have concluded that soy formula is safe and promotes normal growth in infants.

"In addition, Dr. Fitzpatrick's use of the word 'toxins' in referring to certain compounds in soybeans is inaccurate and misleading. Phytate, one of these alleged 'toxins,' is widely present in plant foods and, in particular, in food grains" [such as wheat]. Address: PhD, Port Townsend, Washington.

1429. *NSRL Bulletin (National Soybean Research Laboratory, Urbana, Illinois).* 1995. Researchers tap genetic biodiversity for benefit of soybean producers. 2(3):4-5. Oct.

• ***Summary:*** "Millions of years after their ancestors parted company on the northern shores of Australia, the world-roaming soybean plant, *Glycine max*, and its wild perennial relative, *Glycine tomentella* have been reunited by researchers from Australia and the United States." "The breakthrough came after near 15 years of painstaking laboratory work by Theodore Hymowitz, professor of plant sciences, and his co-workers in the Department of Plant Sciences at the University of Illinois." In 1993 they first succeeded in producing fertile soybeans containing genes from the Australian relative, commonly known as "woolly Glycine." Researchers hope that the new types soybeans will be able to thrive in dry conditions and have resistance to major diseases, especially soybean rust–which has not yet invaded the continental United States, though it is found on soybeans in Hawaii.

"The ancestor of the soybean and its Australian cousins probably evolved in Southeast Asia tens of millions of years ago. Australia at that time was much further south than it is today. After slowly drifting north, the Australian continent finally collided with Southeast Asia about 15 million years ago. The soybean ancestor was one of many Asian plants that used this opportunity move into Australia. The plants that stayed in Asia evolved into a wild annual type of soybean that was domesticated in China about 1100 B.C. In Australia, the soybean ancestor evolved into at least 16 different perennial species that today grow wild across much of the continent and on many south Pacific islands."

At the University of Illinois, Prof. Hymowitz began his research program in 1976 with the idea of tapping the genetic diversity of wild perennial Glycine species for the benefit of soybean producers. In 1976 only six wild perennial species were known. Today the number stands at 16. Hymowitz ran into obstacle after obstacle, as each cross he tried produced a sterile plant. Finally in 1993, he and his colleague Ram Singh, created a series of fertile plants containing all 40 soybean chromosomes plus one from woolly Glycine–carrying the trait of resistance to rust. If rust "comes to the mainland of the United States, the impact would be enormous. Much of the production in the southern states would be threatened," Hymowitz is working with Tony Brown and other scientists from CSIRO in Canberra, Australia, to screen lines of wild Glycine that carry resistance to the Asian rust. There is no other known source of field resistance to rust.

A photo shows Prof. Hymowitz examining the flowers of hybrids developed by crossing the domestic soybean with wild perennial soybean relatives from Australia.

1430. Gordon, Jonathan. 1995. Work with soyfoods in England and Australia (Interview). *SoyaScan Notes.* Nov. 16. Conducted by William Shurtleff of Soyfoods Center. [1 ref]

• ***Summary:*** Jonathan's PhD thesis was titled "Improved lactic fermentation of soymilk for the preparation of soya bean curd," a subject closely related to soy yogurt. He submitted this thesis in 1992 at the University of Strathclyde [Glasgow, Scotland], working under Brian Wood. When he was midway through writing his thesis, he won a *Monbusho* [Ministry of Education] scholarship to Japan. Just as he was preparing to go, he and his wife had a baby and he decided not to go. Prior to that the University of Strathclyde had applied for a patent on the process he discovered in his thesis. When he didn't go to Japan, the university did not finish the patent application process. Its present status is unclear. He discovered how to do a lactic fermentation of soymilk that gave a good, low pH in a reasonable period of time. Brian Wood was an expert in lactic acid fermentations; he developed a 6-week miso and soy sauce process which he sold to Nestle. He was very unhappy with the outcome of this sale, because Nestle shut him out of involvement with the company. He expected to be actively involved with the company.

Jonathan's interest in tofu goes back to the late 1970s. A native of England, he spent two years (1979-1981) at Findhorn, a spiritual community in Scotland, where he first heard of tofu and he helped to make tofu once a week. Jonathan thinks that Jacques (a French Canadian) started the tofu operation in Findhorn, before Jonathan arrived. Jacques and Allen (British) were making tofu in 1979 when Jonathan was there. Each Thursday after dinner they would take over the kitchen and make about 30-40 lb of tofu, which was served in the communal dining room the next day. Jonathan left Findhorn in March 1981 and arrived in Australia in about July or August 1981. He traveled in Australia with a girlfriend (Karen James of California, who had just finished a professorship at UCLA) and they lived together at the Homeland Foundation in Upper Thora, Bellingen, New South Wales, where they made tofu with other members of the community. Karen also made tempeh. Upper Thora is a little town in the Bellingen (pronounced BEL-ing-un) valley. Some community members had already been making tofu for a long time before he arrived; the tofu company was a completely established local business, with customers and delivery routes, when he arrived. They made about 300 lb/week of tofu and delivered it themselves to nearby communities in insulated cold boxes (called "Eskis," short for Eskimos) in a van. Homeland was also making tempeh at the time, but Jonathan was not a tempeh maker. He left Australia in 1982 to return to England.

In 1982 Jonathan became the foreman and tofu maker for The Regular Tofu Company (RTC) Ltd. in England, owned by John Holt. Jonathan was not with RTC when it started. John Holt was a "Premmie," a disciple of Guru Maraji, the young guru from India. His tofu shop was located in a house adjacent to the Premmie community house or ashram. He converted the small community kitchen (about 14 feet square) into a tofu shop. It had 2 cauldrons and a grinder. This was John Holt's private business; it was not a source of food and income for the Premmie community. John had a family at the time and he employed Premmies to do his work. At this time the tofu was made in a caldron. Guru Maraji came to that part of England many times. Leicester is one of the "Asian centers" of England; it has the largest immigrant population of any city in the country and there were 2 or 3 "Premmie" houses there. Maraji has a large Indian following, in addition to his Western disciples.

Jonathan also helped John Holt design his new factory in at Hayhill Industrial Estate (Unit 25, Sileby Rd., Barrow Upon Soar, Leicestershire LE12 8LD, England). into which Holt moved in about 1984. John Holt lived in Sileby, the town adjacent to Barrow Upon Soar.

Note: This company began making tofu in Dec. 1981 at 75 Chandos St., Leicester, LE2 1BU, England. In June 1984 (now located at 16 The Halcroft, Syston, Leicester, England LE7 8LD) they introduced 4 soy products under the Soyboy brand. John Holt had venture capital in the business, but they weren't getting a sufficient return on their money so John had to sell the company to another rather small company named something like Rainbow (they were making soup and burger dry mixes), which later sold it to Haldane.

Jonathan probably has John Holt's home address in Leicestershire. After Holt sold his business, he bought a franchise in a restaurant business (something like a pancake house) in Northampton or Nottingham, England. Jonathan has heard of Michael Cole of Manchester, but he does not know whether or not Michael ever worked for John Holt. Cole won the Entrepreneur Award of something like £50,000, and that enabled him to build a factory. In the early days only two companies in England were distributing semi-nationally–John Holt's and Michael Cole's. Address: Director of Operations, White Wave Inc., Boulder, Colorado. Phone: 303-443-3917.

1431. *Australian Birdkeeper.*1995. Department of Conservation New Zealand, drops soya based products. Oct/Nov.
• ***Summary:*** "As a result of research carried out by New Zealand bird breeders Dick and Valerie James, the Department of Conservation (DOC) in New Zealand has ceased the feeding of soya based handfeeding products to the endangered Kakapo in the DOC's breeding programs. The Minister of Conservation has also suggested that all other protected species in the department's avicultural facilities were also off such products... In fact as far back as 1917 researchers have been aware of possible antinutritional compounds existing in Soya. There is speculation that some modern commercial processing of soya leaves biologically active levels of toxins in soya based products." The Australian company Vetafarm has decided to remove soya from their hand rearing food, says Colin Davis of Vetafarm. An ad for the company's new "Soy Free" food fills the bottom of this page.

1432. *Consumer (Consumer's Institute, New Zealand).*1995. The soy story: Are soy foods good for your baby, bad for your baby, or doesn't it matter? No. 343. p. 34-35. Nov.
• ***Summary:*** Some people believe the use of soy products should be restricted. "They believe natural toxins in the beans make them unsafe, especially for infants in their first year. But others say soy products should be eaten on a daily basis because they help prevent cancer, heart disease, osteoporosis and kidney disease." Both groups point to phytoestrogens to support their viewpoint. Phytoestrogens are a group of chemicals that have some similarities to the female sex hormone oestrogen. However phytoestrogens have a much weaker effect on the body.

Many of the "reports of possible problems with soy have featured Whangarei bird enthusiasts Dick and Valerie James. In 1992 the James noticed things were going wrong with their breeding programme. Chicks were dying; other birds seemed to mature too quickly; and some suffered from unusual deformities and illnesses."

Investigations failed to discover the cause of the problem. However it was found that bird foods which contained soy products had high levels of phytoestrogens. They commissioned an analytic chemist to search for more information about soy. His findings led the James to be that soy was responsible for their bird problems, and was a potential problem for infants who are fed soy-based products.

"These concerns are shared by Dr. Iain Robertson, a toxicologist at Auckland Medical School, and Prof. Cliff Irvine, an endocrinologist from Lincoln University, as well as a number of overseas researchers."

On the other hand, these concerns are not shared by many medical doctors and scientists, who "say there is no convincing evidence of problems with soy products.

"They point out that in the 30-40 years soy has been used as an infant formula, there has not been even a letter in a medical journal raising the possibility of it causing serious problems." Researchers Dr. Ken Setchell and Dr. Mark Messina say their work suggests that soy is beneficial–protective against a number of diseases. Address: 39 Webb Street, Private Bag 6996, Wellington 6035, New Zealand. Phone: 04-384-7963.

1433. Record, I.R.; Jannes, M.; Dreosti, I.E.; King, R.A. 1995. Induction of micronucleus formation in mouse splenocytes by the soy isoflavone genistein *in vitro* but not *in vivo. Food and Chemical Toxicology* 33(11):919-22. Nov.
• ***Summary:*** Genistein is one of the major soybean isoflavones. Even though it is capable of inducing micronucleus formation, as event associated with genetic damage, plasma levels are unlikely to be sufficiently elevated to produce such an effect. Address: CSIRO Div. of Human Nutrition, P.O. Box 10041, Gouger St., Adelaide, South Australia 500.

1434. *SIN Newsletter (Whangarei, New Zealand).*1995—. Serial/periodical. Whangarei, New Zealand. Soy Information Network. No. 1. Nov. 1995. Editor: Dave Woodhams.

• ***Summary:*** This Newsletter deals largely with issues related to phytoestrogens in soybeans, misinformation about them, and attempts by the U.S. soy industry to prevent critics from pointing out possible health dangers. Issue no. 1 was published in early Nov. 1995 (8 p.). Issue no. 2 was Feb. 1996 (12 p.). Issue no. 3 was June 1996 (12 p.). Issue no. 4 was Sept. 1996 (16 p.). Address: P.O. Box 3285, Onerahi, Whangarei, New Zealand.

1435. Guy, Camille. 1995. Soy infant formula concerns to be aired at conference. *New Zealand Herald.* Dec. 4.

• ***Summary:*** "A Lincoln University scientist will present controversial New Zealand concerns about soy infant formula at a conference in the United States this week.

"Professor Cliff Irvine, a reproductive endocrinologist, has been invited by the United States Food and Drug Administration [FDA] to present a paper at its Arkansas conference on phytoestrogens.

"He will be accompanied by an Auckland analytical chemist, Dr Mike Fitzpatrick, whose findings indicate that soy infant formula and soy infant cereals contain plant estrogens at levels which may be harmful.

"This conclusion is vigorously contested by the soy industry.

"Professor Irvine will also present new findings on phytoestrogen levels in human breast milk, which do not support the soy industry's claim that breast milk also contains phytoestrogens.

"The Health Research Council last week awarded a $32,500 grant to Professor Irvine to look at the effects that soy infant formula has on the reproductive systems of male babies.

"He says this research is necessary because soy estrogens have been shown to affect normal sexual differentiation in the young of several species, with the damage not apparent until puberty. It is not known whether similar effects are found in humans.

"A Soy Information Network has been set up by Auckland scientists and parents."

1436. Martin, Sean. 1995. Aviary keeper wants probe. *Manawatu Evening Standard.* Dec. 15.

• ***Summary:*** "An aviary keeper who saw seventeen chicks die after feeding them a soy-based hand-rearing formula has backed calls for soy products to be fully investigated." Janice edge, an aviary keeper in Kowhai Park, New Zealand, said that in late 1992 and early 1993, chicks raised on the soy-based products at her aviary died within days of becoming ill.

"Last week Health Minister Jenny Shipley said in parliament that the ministry was investigating claims some brands of soybean-based infant formula contain potentially harmful substances." The ministry added, however, that it was unaware of any reputable studies showing that such products were harmful. "The Plunket Society also said there was no reason for undue concern."

1437. *SoyaScan Notes.*1995. Chronology of major soy-related events and trends during 1995. Dec. 31. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Aug. 3–Article titled "Meta-analysis of the effects of soy protein intake on serum lipids," by James W. Anderson, PhD, and coworkers (Univ. of Kentucky) is published in the prestigious *New England Journal of Medicine* (p. 276-282). A summary of 60 scientific studies, it is probably the most significant and influential article on the health / medical benefits of soyfoods ever to be published. It receives widespread media coverage and leads to a large jump in soyfoods consumption in the USA during the following years..

Nov.–The first issue of *SIN Newsletter* is published by the Soy Information Network of Whangerei, New Zealand (editor: Dave Woodhams. Funded by Richard and Valerie James). This Newsletter deals largely with issues related to phytoestrogens in soybeans, misinformation about them, and attempts by the U.S. soy industry to prevent critics from pointing out possible health dangers. Issue no. 2 was published in Feb. 1996.

1438. **Product Name:** Good Life: Non Dairy Soy Drink (Calcium Enriched in Pure Pak Carton) [Premium, or Low Fat].

Manufacturer's Name: Berrivale Orchards.

Manufacturer's Address: McKay Road, Berri, SA 5343, Australia. Phone: (085) 82 1019.

Date of Introduction: 1995.

Wt/Vol., Packaging, Price: 1 liter Pure Pak carton.

How Stored: Refrigerated, 18 day shelf life.

New Product–Documentation: Product information sheets and leaflets sent by Anna Wieczorek, Food Technologist, at Berrivale Orchards Ltd. 1996. March 14. Color photos show both of the cartons. The low-fat product contains less than 1% fat (0.9 gm per 100 ml) while the premium product contains 3.4 gm of fat per 100 ml. These two products are made and/or packed at the company's MacKay plant.

Soyafoods (ASA, Europe). 1996. Spring. p. 4. "Soya products 'down under.'" Berryvale [sic] Orchards has launched GoodLife, a fresh non-dairy soya drink. It has a shelf life of 18 days and is sold in 1 liter containers.

1439. **Product Name:** Good Life: Non Dairy Soy Drink (Calcium Enriched in Long Life Aseptic Carton) [Premium, or Low Fat].

Manufacturer's Name: Berrivale Orchards.
Manufacturer's Address: McKay Road, Berri, SA 5343, Australia. Phone: (085) 82 1019.
Date of Introduction: 1995.
Wt/Vol., Packaging, Price: 1 liter Aseptic Combi carton.
How Stored: Refrigerated.
New Product–Documentation: Product information sheets and leaflets sent by Anna Wieczorek, Food Technologist, at Berrivale Orchards Ltd. 1996. March 14. Color photos show both of the cartons. The low-fat product contains less than 1% fat (0.9 gm per 100 ml) while the premium product contains 3.4 gm of fat per 100 ml. These two Isolate UHT products are made and/or packed at the company's MacKay plant.

1440. Robertson, Iain G.C. 1995. Phytoestrogens: Toxicology and regulatory mechanisms. *Proceedings of the Nutrition Society of New Zealand* 20:35-42. [22 ref]
• ***Summary:*** "Adverse effects may occur by inhibition of the enzyme which converts the relatively impotent estrone to the much more potent oestradiol, and by occupying the estrogen receptor resulting in antagonism of the naturally produced oestradiol." Address: Dep. of Pharmacology and Clinical Pharmacology, Univ. of Auckland Medical School, Auckland [New Zealand].

1441. McMahon, Ron. 1995. Eda-mame (vegetable soybean) development for the frozen export market. Gordon, NSW, Australia: Horticultural Research and Development Corp. 5 p. 30 cm. On cover: VG312 / HRDC Final Report. *
Address: New South Wales, Australia.

1442. Chan, Chi-Keung; Lee, Stella; Le, Naomi. 1996. Vitasoy recalls 30 million drink cartons. *South China Morning Post (Hong Kong).* Jan. 10. p. 1 (Wednesday, ed. 2).
• ***Summary:*** "Soft drinks maker Vitasoy yesterday announced it is to recall an estimated 30 million drink cartons from Hong Kong and the rest of the world because of continuing production problems. The company, acting on more complaints about sour-tasting soya milk, is to also suspend production at its Tuen Mun plant. Managing director Winston Lo Yau-lai, who last week announced suspension of the company's Shenzhen carton production lines, last night would not rule out industrial sabotage.

"Retailers are being asked to stop sales of all cartons of Vitasoy drinks including soya milk, lemon tea and juices in 250-millilitre, 375 ml and one-litre packs. Customers and retailers would be offered refunds... The company estimated that recalling the 15 million packs in circulation in Hong Kong and Macau would take 12 days. But it could not say how long it would take to recall a further 15 million packs from more than 10 countries, including Canada, Australia, and the United States.

"Yesterday's announcement followed three more complaints from consumers concerning sour soya milk produced at the firm's Tuen Mun plant... The group decided to recall eight million drinks manufactured in Shenzhen last Thursday after a barrage of complaints. A day later, it also recalled 42,000 cartons produced in Tuen Mun... The company promised none of the 1,000 workers at the plant would be affected. The recall does not affect the company's bottled products including soya milk, iced teas, distilled water and Vita fresh milk. But paper products represent 'a significant proportion' of turnover.

"The firm admitted that the latest recall would have a 'material adverse effect' on profits. Vitasoy International shares will also be suspended from stock market trading from this morning. The news came just as its share price was recovering from the sharp fall caused by last week's announcement of the problems with Hong Kong and Shenzhen production. After falling more than eight per cent since Friday, the price yesterday rose five per cent to $3.125.

"Mr. Lo rejected claims the announcement had been provoked by Health Department pressure." Preliminary results of Health Department tests showed that of the 240 samples tested, only "four had been found to have abnormal acidity."

"'While bacteria were found in these four samples, they were not of pathogenic (disease-causing) nature,' a spokesman said. 'Further tests will be conducted to confirm the exact identity of the bacteria.'"

1443. Guy, Camille. 1996. Soy still under scrutiny. *New Zealand Herald–Wednesday Magazine.* Jan. 10. Wednesday.
• ***Summary:*** Dr. Cliff Irvine, professor of endocrinology at Lincoln University, has just begun a study, funded by the Health Research Council, on the effects of soy formula. He told an FDA-sponsored conference in the United States, that phytoestrogens in soy infant formula are not eliminated by normal processing. "Since these isoflavones have marked effects on the reproductive development of many animals, some scientists are concerned that they may also be compromising the sexual development of human infants."

He wants to test the urine of male babies who have been fed soy formula to see if isoflavones are metabolised into active oestrogen compounds. If they are, he will then measure testosterone levels in those same babies.

"Irvine explains that breast-fed male infants normally experience a surge of testosterone within the first four months of life. That surge lays down irreversible pathways in the brain which determine development at puberty."

A photo shows four dead parrot chicks.

1444. Hymowitz, Ted. 1996. *Glycine javanica* was renamed *Glycine wightii*, then removed from the genus *Glycine* and placed in a new genus as *Neonotonia wightii* (Interview). *SoyaScan Notes*. Jan. 31. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Plants that used to be named *Glycine javanica* and *Glycine wightii* (pronounced glai-SEE-nee WAI-tee-ai) are now correctly named *Neonotonia wightii*. Thus these plants were never actually relatives of perennial soybeans. In 1966 Verdcourt proposed renaming *Glycine javanica* to *Glycine wightii*. The proposal was repeated in 1971 in his book *Flora of Tropical East Africa*. Then in 1977 a scientist named James Lackey removed *Glycine wightii* from the genus *Glycine*, created a new genus *Neonotonia*, and put this single species in the new genus with the new name *Neonotonia wightii*.

Ted wrote about changes in the genus *Glycine* in an article titled "A Reappraisal of the Subgenus Glycine" (Newell & Hymowitz 1978, *American J. of Botany* 65(2):168-79). This plant has not been mentioned by Hymowitz in any of his papers on the genus *Glycine* or taxonomy published during roughly the last 5 years; it is in a different genus and therefore unrelated. He wrote a paper titled something like "Where are the ancestors of the soybean?"

Linnaeus described 7 or 8 species in the genus *Glycine*. *Glycine javanica* is the type species for the genus. If that particular is removed from the genus, what do you call the remaining species? Verdcourt, at Kew, suggested that the taxonomic principle of "conservation of name" be applied in this case. Because the soybean is so well known, they decided to conserve the name *Glycine*. The way to conserve it is to find in the literature the next article describing the genus; this was Willdenow. That is why nowadays when you see the genus *Glycine*, you no longer see "(L.)" for Linnaeus, but rather "(Willd.)" for Willdenow, because the genus name has been conserved. So when you see these articles from tropical countries such as Brazil or Cuba concerned with the forage plant, *Soja perene* (this is the Brazilian name), they are talking about a plant that is now considered to be unrelated to the soybean or the genus *Glycine*.

The key question is this: Why did taxonomists change the name of *Glycine wightii?* It has to do with work that Ted and his coworkers did in the germplasm collections and in cytology. The *wightii* is essentially of African origin and it has a chromosome number of 22 and 44. The chromosomes are much different from the *Glycine* chromosomes. Moreover *Glycine* is distributed throughout much of Asia and Oceania, but is not found in Africa.

Why did Linnaeus give this plant the species name *javanica?* We are not sure. Why did he name the genus *Glycine?* One of the species which he included in his original genus *Glycine* is now named *Apios americana;* it is a tuber with a sweet root, and the word *Glycine* is derived from this sweetness. All of the species which Linnaeus originally assigned to the genus *Glycine* are no longer in *Glycine*. That's why they had to conserve the genus *Glycine*. *Wistaria* and *Teramnus* also used to be in *Glycine*.

Many agronomists (they are not known to be taxonomists) are not aware of this change and continue to use the old names in the genus *Glycine*. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

1445. Manfredi, Steve. 1996. Soybean made simple. *Financial Review (Sydney, Australia)*. Feb. 2. p. 11. Weekend.

• ***Summary:*** The writer, Tami Ohnui (a specialist soybean grower) and Kei Fukui (an excellent Japanese cook) explain very briefly how to make fermented black bean sauce, soy sauce, fermented black beans *(shi)*, tofu, fermented tofu, and edamamé.

1446. Lo, Francis. 1996. K.S. Lo died on 5 May 1995. Vitasoy went public several months earlier (Interview). *SoyaScan Notes*. Feb. 19. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Francis is the grandson of K.S. Lo (one of Mr. Lo's 18 grandchildren) and the son of Frank Lo. As a young man Frank studied cheese-making in Australia at the Queensland Agricultural College. Frank is currently in charge of new developments in China. Francis is presently a third year student at the University of Guelph in Canada, studying agricultural business. He would like to get some business experience before he goes to work for Vitasoy; he does not want to use the company as a training ground. Vitasoy shares were first sold to the public in about February or March 1995. Francis has a copy of the booklet that was published at that time. Address: Univ. of Guelph, Guelph, ONT Canada.

1447. Messina, Mark; Messina, Virginia. 1996. SoyFacts No. 11: Soyfoods & women's health (Leaflet). Lebanon, Indiana: Indiana Soybean Development Council. 2 p. Front and back. 28 cm. [21 ref]

• ***Summary:*** Contents: Introduction. Breast cancer. Menopause. Osteoporosis. Heart disease. Soy and fertility. Soyfoods in the diets of women.

"Menopause: The decrease in estrogen production that signals menopause can produce a variety of symptoms. These include difficulty in regulating body temperature that manifests as night sweats and hot flashes. However the severity of menopause symptoms varies throughout the world. For example, Asian women are typically one-third as likely as American women to report symptoms. Although, to some extent, this may reflect cultural differences regarding willingness to discuss these symptoms, there appears to be an actual difference in the severity and incidence of symptoms (Lock 1994). Soy consumption has been proposed as one explanation for these differences. The estrogenic activity of soybean isoflavones may help to offset the effects of reduced estrogen production by the ovaries. Even though soy isoflavones exhibit very weak activity (1/1,000 to 1/100,000 the potency of endogenous estrogen), in women consuming soyfoods, blood levels of isoflavones can be 1,000 times higher than endogenously produced estrogen levels (Xu et al. 1995). Most important, in a recent Australian study, researchers found that women who consumed 45 grams of soy flour per day experienced a 40 percent decrease in menopause symptoms (Murkies et al. 1995). Several studies examining the effects of soy on menopause symptoms are under way."

Note 1. One version of this leaflet was developed for consumers and another for dietitians. The project was funded by the Indiana Soybean Development Council.

Note 2. The issue of goitrogens / goitrogenic substances in soybeans and soyfoods is not discussed in any of these 11 leaflets. Address: 1. PhD; 2. MPH, RD. Both: Nutrition Matters, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

1448. Woodhams, Dave. 1996. Gag the messenger. *SIN Newsletter (Soy Information Network, Whangarei, New Zealand)* No. 2. p. 2-4. Feb.
• ***Summary:*** In October 1995, Dr. Mike Fitzpatrick, then of Grayson Laboratories, was forbidden to speak or write publicly in the soy debate on pain of instant dismissal from his job. He had been invited to present a paper on "The Phytoestrogen Content of Soy-based Infant Foods" at the Third International Conference on Phytoestrogens, at Little Rock, Arkansas. The types of pressure put on Dr. Fitzpatrick are discussed. "He was able to attend the conference on the condition that he did not ask questions in the open sessions or speak to the press on his return." Address: PhD., CEng, MIChemE, MIPENZ, MNZIC, 2/47 Church St., Devonport 1309, New Zealand.

1449. Wieczorek, Anna. 1996. Re: Berrivale Orchards Ltd. Letter to William Shurtleff at Soyfoods Center, March 11–in reply to inquiry. 1 p.
• ***Summary:*** "Berrivale Orchards is the largest manufacturer of fruit juice products in Australia. We are a wholly owned Australian company controlled by Fruit Packing Co-operatives, which are owned by small individual growers."

Note: A color brochure and various product description sheets notes that at the McKay plant the company also makes or packs two Soy Drink products, in 1 liter low fat and premium types. At the Sturt plant the company makes or packs three types of Soy Milk: "Milk extraction from Soya Beans–'Berri.' Pure Harvest Soy and Rice Milk. Good Life Soy Drink (Isolate UHT Soy)." Berri and Good Life Soy Drink are made from soybeans groan and harvested in Australia. Good Life is made at Berri, heart of Australia's Riverland. Good Life Soy Drinks are available in 4 varieties: UHT 1 liter combi in either premium or low fat. Chilled 1 liter PurePak in either premium or low fat. Address: Food Technologist, Technical Dep., Berrivale Orchards Ltd., P.O. Box 396 (McKay Road), Berri, SA 5343, Australia. Phone: (085) 82 1661.

1450. Roberts, Rosemary. 1996. Moves set to open up debate on the suitability of soy. *Northern Advocate (Whangarei, New Zealand).* March 19.
• ***Summary:*** "Two scientists who last year went public on the possible adverse effects of soy infant formula are putting their money where their mouths are in a big way.

"Consultant food technologist Dr. Dave Woodhams of Auckland has started a newsletter he hopes will provide an open forum for the debate on soy products.

"He is working for no pay and has largely set aside his own successful consultancy while he gathers information for the newsletter."

A sidebar titled "Deeper and deeper into scientific studies," states: "Food technology consultant Dr Dave Woodhams says he has spent about a third of his professional time on the soy issue over the past two years. For the past three months it has occupied all his time, he adds.

"He has been drawn somewhat unwillingly into the debate by his sister-in-law, Valerie James, and her husband, Dick, who asked him to explain scientific aspects of the material [documents] they were gathering from around the world on soy products. That work had been triggered by the mysterious deaths of some of their exotic birds."

A photo shows Dr. James Woodhams.

1451. Nance-Kivell, Greg. 1996. Re: New developments at EarthStar (formerly Chinese Farmhouse Tofu). Letter (fax) to William Shurtleff at Soyfoods Center, March 28 and April 2. 3 p. Typed, with signature on letterhead.
• ***Summary:*** "In Jan. 1991 the Challenge Foundation (a nonprofit organisation working with the disabled) bought a small tofu business called Chinese Farmhouse." It consisted of a plant with one 100 liter gas cooker, two 80-liter round coagulation tubs, one hydraulic press, two 10 kg pressing trays, and a wall-mounted ratchet pressing system.

"A small group of two supervisors and five staff (disabled) made about 60 kg of tofu per day, on a good day, for 3-4 days per week, and cleaned on remaining days. The Foundation had no idea of food manufacturing, but thought that a hands-on manufacturing plant might be suitable for this group of workers. They became alarmed when overheads, establishment and staff costs made the venture non-viable. Workers are paid award-based wages–indexed to the level of disability.

Starting in late 1991, Greg was asked to help, two days a week, as a consultant. They bought more equipment and employed more staff. Sales increased to a break-even point at about 700 kg/week (3,000 kg/month). The overwork fatigue set in and production dropped. Products include: Tofu (hard, organic), tofu (herbed), soya yogurt (3 fruit flavours), soya mayonnaise, and dressings (4 flavours).

At present they are developing an ice cream and related products based on soy yoghurt, and are looking at tamari and shoyu production from whey and okara. Don McCallum is the factory manager.

Enclosed is a label for EarthStar certified organic tofu (750 gm). Note: The letter of 2 April 1996 was handwritten on letterhead with signature–in reply to 7 questions that Shurtleff faxed to Greg about the first letter. Address: Consultant Food Technologist, EarthStar, 5 Kay Street, Murwillumbah (P.O. Box 654), Murwillumbah, NSW 2484, Australia. Phone: (066) 72 5931.

1452. Irvine, Cliff. 1996. Phytoestrogen conference challenges. *Nutrition News (New Zealand Nutrition Foundation).* March. p. 2-3.
• ***Summary:*** "On 3-6 Dec. 1995 the Third International Conference on Phytoestrogens sponsored by the National Centre for Toxicological Research, Food and Drug Administration, U.S.A. was held in Little Rock, Arkansas, U.S.A. The 80 delegates were addressed by principal speakers from U.S.A., Sweden, Finland and New Zealand. While 80 delegates is a relatively small enrollment for an American conference, it was double the number who attended the Second Conference in the same venue in 1993 and a large increase on the 9 who attended the First Conference in 1990."

"Although there are several phytoestrogens in plants consumed by humans most of the attention was directed to the soy isoflavones genistein and daidzein." Address: Professor, Reproductive Endocrinologist, Lincoln Univ. [Canterbury, New Zealand].

1453. Joyce, Michael. 1996. Update on tempeh in Australia (Interview). *SoyaScan Notes.* April 22. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Michael is still in business making tempeh. Address: Tempeh Manufacturers Pty. Ltd., MS. 84, Nambour 4560, QLD, Australia. Phone: 074-467-342.

1454. Nguyen, M.H.; Tran, T.T.V. 1996. An evaluation of a new infrared radiation system for whole soybean processing. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 466-71. [5 ref]
• ***Summary:*** Infrared radiation of whole, dry soybeans in a rotating drum destroys trypsin inhibitor activity without affecting the total proteins. However it also decreases protein solubility of the whole soybeans, reduces their moisture content, and prevents them from germinating. Address: 1. Senior lecturer, School of Food Science, Univ. of Western Sydney-Hawkesbury; 2. Manager, Australian Office, Epco.

1455. Nguyen, M.H.; Hicks, P.A. 1996. Australian membrane technology for soybean processing. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 534-39. [6 ref]
• ***Summary:*** The most common membrane technology processes are microfiltration (MF), ultrafiltration, reverse osmosis (RO–also known as hyperfiltration, HF), and electrodialysis. Contents: Abstract. Introduction: Principles. Simple applications. Ultrafiltration membrane as a membrane reactor. Potential applications: Microfiltration of process water, ultrafiltration of soy whey, nanofiltration for soy whey recovery, advanced applications (counterdiffusion for the desalting of soysauce {fig. 3}, microfiltration, ultrafiltration, osmotic distillation). Address: 1. Senior Lecturer, Univ. of Western Sydney, Hawkesbury, Australia; 2. Agricultural Engineering/Agro Industry Officer, RAP, FAO of the UN, Bangkok, Thailand.

1456. Nguyen, Q.V. 1996. Production of vegetable green soybean *(Edamame; Glycine max* (L.) Merr.) for the domestic market and trial shipments to Japan. New South Wales, Australia: Horticultural Research & Development Corporation. April. Illust. (some color). 30 cm. Series: Final report / Horticultural Research & Development Corporation, No. VG433 or DAN-1134. *
Address: New South Wales, Australia.

1457. Shanmugasundaram, S. 1996. The evolving global vegetable soybean industry. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 472-78. [6 ref]
• ***Summary:*** Contents: Abstract. Introduction & history. Vegetable soybean–Area, production, supply, demand, domestic and foreign trade: Japan, Taiwan, USA, other

countries (Thailand, China, Vietnam, Indonesia, Australia, New Zealand). The role of AVRDC in the evolving scenario of vegetable soybean (Malaysia, Sri Lanka, Granada, Philippines). Address: Plant Breeder, and Director, International Cooperation Program, Asian Vegetable Research and Development Center, P.O. Box 42, Shanhua, Tainan 741, Taiwan.

1458. Sherkat, F.; Huang, Willy. 1996. Biosoghurt, a quality product from local ingredients. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 200-05. [9 ref] Address: Dep. of Food Science, RMIT Univ., Melbourne, Australia.

1459. Vinning, Grant. 1996. Wholesale market analysis of green vegetable soybean in Japan and Taiwan. In: Alex Buchanan, ed. 1996. Proceedings of the Second International Soybean Processing and Utilization Conference: 8-13 January 1996, Bangkok, Thailand. Bangkok, Thailand: Printed by Funny Publishing Limited Partnership. Distributed by The Institute of Food Research and Product Development, Kasetsart University. xviii + 556 p. See p. 488-96. [1 ref]

• ***Summary:*** Contents: Price profiling. Background and table showing names of green vegetable soybeans in English, Chinese, Indonesia, Japanese, Malaysia, Malaysia, Philippines, Thailand, and Vietnam. Production trends in Japan. Wholesale throughput and prices in Japan. Monthly wholesale throughput and price data. Japanese imports of frozen and fresh edamame. Taiwan production, wholesale prices, and export volumes. Conclusion.

Japan is the world's largest importer of edamame and Taiwan is the major supplier. It appears that Japan's domestic production is decreasing but demand is not. Taiwan's production will probably not be able to meet the export demand, the demand-supply gap is estimated at 10,000 tonnes (metric tons) and is widening. While Thailand and China may attempt to fill this gap with frozen products, freshness is a major issue.

Note: This paper contains numerous graphs, however they have no units on the x or y axis, so are almost impossible to use. Address: Asian Markets Research, 157 Horizon Drive, Westlake 074, Australia.

1460. Barrett, Julia. 1996. Phytoestrogens, benefits and risks. Research Triangle Park, North Carolina: National Institute of Environmental Health Sciences. 7 p. May 22. 21 cm.

• ***Summary:*** A well-written introduction with no references. Address: North Carolina.

1461. Roberts, Rosemary. 1996. Soy formula campaign wins praise. *Northern Advocate (Whangarei, New Zealand).* May 24. p. 2.

• ***Summary:*** "Work being done by Whangarei couple Dick and Valerie James to have soy infant formula withdrawn from sale and tested for toxins, particularly soy oestrogens, has won the admiration of Professor Reg Morgan of Perth.

"Mr Morgan, who visited Mr and Mrs James last week, heads the department of physiology at the University of Western Australia.

"For the past 20 years he has been investigating the chemicals in raw soy flour, called trypsin inhibitors, which have been shown to cause pancreatic cancer in rats."

Note: The date of this article may be Sept. 25–instead of May 24.

1462. Heenan, Cathy. 1996. Talk on soy infant formulas. *Otago Daily Times (Dunedin, New Zealand).* May 31.

• ***Summary:*** This article also appeared in *Gisborne Herald* 1 Jun 1996.

1463. Kuhn, Mary Ellen. 1996. Soy in the spotlight: Disease-fighting benefits may change the image of the once-lowly bean. *Food Processing (Chicago).* May. p. 52-53, 55, 58.

• ***Summary:*** This is a cover story; on the cover is written: "Unlocking the secrets of soy," with four large color photos. The article begins: "What a difference a couple of decades make." Twenty or 30 years ago, most foodservice operators and consumers used soy with hesitation, sometimes scornful comments. "Today, however, the once-maligned soy protein has a much better image, thanks to a fast-mounting stack of research data suggesting it may help prevent and treat high blood cholesterol, cancer, osteoporosis, and symptoms of menopause." And this good news has begun to reach health and nutrition professionals. With better products on the market, "soyfoods marketers may soon be dealing with a new generation of mainstream consumers who–far from spurning soy-based products–actively seek them out.

"Much of the current soy research is focused on isoflavones, a unique class of phytoestrogens or plant hormones found primarily in soy protein." The main soy isoflavone is genistein. Now soyfoods manufacturers are starting to take isoflavone content into consideration when they formulate, label, and promote their products. The isoflavone content of unprocessed soybeans can vary considerably among varieties, years, and place of harvest. Heat treatment does not appear to significantly reduce isoflavone content, but an alcohol wash (used with most soy protein concentrates and isolated soy proteins) removes most isoflavones in the product. The well-known Supro brand of isolated soy proteins are not subject to an alcohol wash, which helps preserve their isoflavone content.

Rick McKelvey, president of the Soyfoods Association of America, has attended the American Dietetic Association show for the past two years. Last year, most of the questions he heard were: "What is this soy stuff that I'm hearing about?" This year's questions concerned the level of isoflavones in specific products. "This shows how far we've come in the bast year," he observes.

ADM, which could easily extract isoflavones from soybeans and sell them has decided not to do so. Jerry Weigel, PhD, who is ADM's vice president of corporate nutrition and regulatory affairs thinks it is probably not legal to sell isoflavones because they do not have GRAS (Generally Recognized as Safe) status or food additive status. Few soyfoods marketers are presently publicizing the isoflavone or genistein content of their products or making specific health or disease-prevention claims.

William Helferich, PhD, an associate professor at Michigan State University's Department of Food Science and Human Nutrition, has been studying dietary phytoestrogens in laboratory animals for 3 years. He has found that "genistein can stimulate estrogen-responsive breast cancer-cell growth in cultured cells and in animals implanted with these cells. He believes that women at risk for estrogen-dependent forms of breast cancer should not consume high levels of phytoestrogens." Most researchers are concerned about consumers taking isoflavone supplements or pills. Yet such products are now on the market and they acknowledge that some consumers will be attracted to them, instead of simply increasing the level of soyfoods in their diet, eating a healthful, balanced diet, and living and healthy lifestyle. Photos show: A jar of Morningstar Farms Roasted Soy Butter (soynut butter) which will be introduced this spring. Jan Remak, president of marketing for Vitasoy U.S.A.

One sidebar, titled "Probing the soy/health connection," discusses the research of Dr. James Anderson and Mark Messina, PhD. "Scientists theorize that phytoestrogens in soy might help compensate for the loss of hormonal estrogen women experience at menopause."

Another sidebar, "Boom times for the bean," notes that starting soon after the research study by Dr. James Anderson was published in August 1995, many soyfoods companies experienced a substantial increase in sales. Peter Golbitz notes that "After years of steady 10% to 15% annual growth, soyfood sales have soared by about 30% in the past year... Many marketers of meat and dairy analogs are reporting sales increases of more than 100%." A 1995 study by the Soyfoods Association of America found that 75% of Americans have heard of tofu, 55% of soymilk, and 50% of soy burgers. Golbitz adds that in Australia, where soymilk based on soy protein isolates is widely available, per capita soymilk consumption is at least three times what it is in the USA. Vitasoy has adopted a niche-market approach to selling its soymilk; it adjusts the amount beany taste according to the taste preferences of each market. Address: Senior Editor.

1464. **Product Name:** Vege Hot Dog, Vege Sausage, Vege Sausage Curried, Vege Party Franks, Vege Henchen, Vege Herb, Vege Smoke, Vege Garlic, Kaiser Royale, Notchicken Nuggets, Notfish Nuggets, Vege Kabana, Notburgers, Notdogs, Notbacon, Notpepperoni, Vege Chicken, Vege Ham, Notchicken Breast Fillets, Notfat Burger.
Manufacturer's Name: Longa Life Vegetarian Products.
Manufacturer's Address: 6 Binary St., Yatala (near Brisbane), QLD 4207, Australia. Phone: +61 7 3807-2433.
Date of Introduction: 1996. May.
Ingredients: Blend of cereals and soya fibre.
Nutrition: Per 100 gm.: Energy 906 Kjoules, protein 16.2 gm, dietary fibre 4.5 gm, sodium 270 mg, potassium 800 mg.
New Product–Documentation: Spot in Soyafoods (ASA, Europe). 1996. Spring. p. 4. "Soya products 'down under.'" "Longa Life Vegetarian Products is producing NotChicken and NotFish Nuggets, meat and fish free nuggets manufactured from a blend of cereals and soya fibre... The products are wheat and yeast free and are suitable for lacto-ovo vegetarian and Halal [like kosher for Moslems] diets." They contain less than half the fat of regular chicken and fish nuggets.

Letter from Graeme W. McDougall, managing director, Longa Life Vegetarian Products Pty. Ltd. 1996. His company now makes 20 vegetarian meat alternatives. Inserts include "Dietary information" on each (vegetarian, vegan, egg-free, dairy-free, halal, low gluten, yeast free), "Ingredients," "Longa Life Buddhist Vegetarian Products" (free of onions, garlic, leeks, etc.), About the company ("Longa Life is a foundation member of 'The Vegetarian Development Association of Taiwan'"). It has distributors in Singapore / Malaysia and Hong Kong. They have a website (www.ozlink.com/longalife) and an e-mail address (longalife@ longalife.com.au). Six-panel full color leaflet of products and recipes (each panel 11 cm square). Two large (30 cm, one side) glossy color sell sheets for Notburgers and Notdogs. Two smaller sell sheets (21 cm, both sides) for Notfish Nuggets and Notchicken Nuggets, and for Notbacon and Notpepperoni. All are very artistically done.

Natural Products Expo. at Anaheim, California. 1997. March. Sent by Patricia Smith. Color leaflets (15 by 21 cm) for: Notbacon, Notpepperoni, Notchicken Nuggets, Notfish Nuggets.

1465. Eden Foods, Inc. 1996. Eden Foods protests USDA's proposed organic standards (News release). 701 Tecumseh Road, Clinton, MI 49236. 1 p. June 4. Accompanied by 4-page letter to Hon. Daniel Glickman.

• ***Summary:*** "Clinton, Michigan–Eden Foods has informed U.S. Secretary of Agriculture Dan Glickman of its objection to the fact that, as now proposed, the national standards for organically grown food under the Organic Foods Production Act of 1990 would bar Eden Foods, or any other company, from informing the public that it upholds higher standards for certified organic food than those proposed by the USDA. For over 25 years Eden Foods has worked closely with 180 family farms in developing standards for growing and processing organically grown food; for independents third-party inspection and certification; and for audit trail record keeping. The natural food consumer has come to expect this high level of protection and authenticity for organically grown food. These standards and practices are consistent with those in place in Europe, Canada, South America, Asia, Australia, Mexico, and India. These standards currently in force further the development of sustainable agriculture by providing incentive for improvement. The federally proposed organic standards remove incentive to improve and make federally mandated minimum standards the maximum by outlawing any communication in the U.S.A. about higher standards. Mr. Michael Potter, Chairman of Eden Foods, states, 'As proposed, the federal organic standards set back the organic food movement thirty years. They allow the use of food additives and processing aids heretofore never allowed. At the same time they make it illegal to communicate about our, or anyone else's, higher standards. The proposed federal standards would severely undermine this country's sustainable agriculture movement, and be the laughing stock of the international organic farming community.'"

Note: In the summer of 1970, Bill Bolduc of Eden Foods established Eden's first contact with an organic food grower–Bill Vreeland of Ypsilanti, Michigan, who grew organic wheat and soybeans. The two Bills drew up a contract and Bolduc soon made Eden's first direct purchase of organically grown wheat, which the company milled and sold. Soon Bolduc also purchased organically grown soybeans, corn, and rye from Vreeland. These crops, organically grown in Michigan, are shown in the Eden Foods Wholesale Pricelist of 26 July 1971, so they must have been grown during 1970. Address: Clinton, Michigan.

1466. Messina, Mark J. 1996. The health benefits of phytoestrogens in soybeans are increasingly unclear. Many uses are being patented and conflicts of interest are increasing (Interview). *SoyaScan Notes.* June 4. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** At the soy symposium in Brussels, many researchers will be presenting new data as well as some published papers. Mark is not at all sure about how people will feel when the symposium is over about "The wonders of soy"; the very positive sound bites that some people are hoping for may not be there. But certainly from an academic perspective it should be quite interesting and stimulating. Already some conflicts among the papers are emerging.

Times are changing in the world of science that seeks the truth. Scientists are much quicker to get patents these days, and phytoestrogens are quite patentable. There are now a number of similar or conflicting patents. Two or three people and companies have patents on using genistein to treat osteoporosis. The patents are on the use, but Mark cannot see how they will be of practical value. For example, Mark was told that Tufts University has a patent on use of isoflavones for a wide range of conditions, such as heart disease, osteoporosis, etc. Steve Barnes may have one for osteoporosis.

The people at Bowman Gray School of Medicine, Wake Forest University (in North Carolina), think–based on their monkey study–that it is the isoflavones in soybeans that lower blood cholesterol, not soy protein. But this is not new; during the 1970s, isoflavones were used to lower cholesterol in rats. So Mark found it very surprising that anyone could get a patent on isoflavones lowering cholesterol, because it is already in the literature and is not a "discovery."

Mark finds the whole area quite confusing, but it is clear that when a scientist is financially invested in something, it becomes increasingly difficult to accept information that conflicts with or might hurt that financial interest. Mark feels it is a conflict of interest for a person who teaches about nutrition to also become financially involved in commercial food-related products. It is hard enough being a consultant and having to deal with negative data about the health benefits of soy. Mark has an upbeat "infomercial" presentation that he can give where people run out of the room and drink soymilk, or he can give a presentation to academics which includes conflicting information. A consultant who presents a balanced picture, including conflicting information, is not likely to be asked to speak again. Mark has come to believe that it is their ties to products or money which prevents some people in the field from being as open minded as Mark thinks they should be about some issues. So we will find it increasingly difficult to do good science which simply seeks the truth.

Mark feels that the data showing that soy reduces breast cancer risk is pretty minimal, at best. The prostate cancer data is stronger. There have only been 3 really good case control studies on soy intake and breast cancer. One showed soy was very protective in premenopausal women, but with no protection in postmenopausal. The second showed slight protection in premenopausal, with no protection against postmenopausal, and the third showed no protection in either group. So there is no data showing that soy reduces postmenopausal cancer and some data showing it reduces premenopausal. But most breast cancer is postmenopausal.

Some breast tumors are estrogen-sensitive (also called estrogen-positive) and some are not. The ones that are estrogen-sensitive are more easily treated because they respond to hormonal treatments. Moreover, some tumors start out being estrogen-sensitive then later become estrogen-insensitive. In vitro, genistein stimulates the growth of *estrogen-sensitive* breast cancer cells at low concentrations but at higher concentrations it inhibits the growth. But the lower concentrations are probably more representative of real-life situations. Mark now has a color slide titled "contraindications for soy" which he uses at lectures. He thinks there is a potential contraindication for every situation in which phytoestrogens might be used–from infants, to young children, to women trying to get pregnant, to postmenopausal women with a high risk of developing estrogen-sensitive breast tumors. Thus, we must start to recognize that there are some real "down-sides" to soy. For example, he thinks that postmenopausal women who have or have had estrogen-sensitive tumors should not be consuming soy. Even though soy may reduce the risk of prostate cancer, there is also some evidence that it may reduce testicle size–definitely NOT a plus for men. So to real scientists, the situation is looking more complex, and the health benefits of soy don't appear nearly as clear cut as they did a year or two ago. Looking just at the estrogenic component of soy, estrogens do wonderful things for certain people at certain times in their life and they may have negative effects at other times.

Mark feels very frustrated at the way many people are exaggerated the benefits and ignoring the down-side of soy isoflavones. He sometimes thinks he would like to do an exposé of this important problem. Mark still can't point to any decent animal studies showing that isoflavones have any anticancer effect. The data on soy are insufficient, and much weaker than the data on fruits and vegetables in this area. Mark's basic feeling is that if the soy industry is quick to embrace the potential health benefits of soy, we need to also be open-minded enough to consider any downside. He doesn't find at the moment that people are doing that. "This is potentially a hugely devastating issue for the entire soy industry." When the proceedings of the Brussels symposium are published, 10,000 professionals are going to see the well-argued position that soy infant formula is not safe for infants, and other concerns will be expressed in there as well.

Ken Setchell, who helped found the field of research on the medical benefits of soy isoflavones, is a brilliant scientist (perhaps a genius), told Mark recently that he thought the reason soy lowers cholesterol levels is because it contains no cholesterol.

There is a chance that this sense of complexity and frank discussion of the "down-sides" of soy may not emerge that strongly from the Brussels symposium because so many of the researchers who are presenting have strongly vested interests in the hypotheses they are testing. There will be a few scientists presenting on negative aspects of soy isoflavones; Mark had to "dis-invite" one speaker because symposium organizers were upset that she was too strongly anti-soy. She has been linked with the Jameses in New Zealand. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

1467. Connor, Steve. 1996. The poison risk in 'healthy' eating: Natural toxins in food pose a greater potential danger than man-made chemicals. *Sunday Star-Times (Auckland, New Zealand).* June 9.

• ***Summary:*** Pulses and beans, which are the epitome of healthy eating, contain the widest variety of biological toxins. "Included in this list of poisons–most of which are destroyed by cooking–are substances known as phytoestrogens, plant chemicals that can mimic female hormones." They "cannot be ignored in the search to find the cause of falling sperm counts." They are present in soya beans, which are used to make soy infant formulas. "Scientists are therefore seriously questioning whether soya milk products, given at a critical moment in the development of the male reproductive system, could be responsible for lower sperm counts." Address: London.

1468. Guy, Camille. 1996. Soybean campaigner turns up the heat: A visiting professor tells about his concern over the sale of food containing soybean. *New Zealand Herald–Weekend Magazine.* June 15. Section 7. p. 10. Saturday.

• ***Summary:*** Reg Morgan is a physiology professor at the University of Western Australia. During a trip to New Zealand, he compared the promotion of soy products as health foods with "cigarette advertising at the turn of the century." He also joined with New Zealand scientists to "warn parents that using soy infant formula may put their babies' health at risk. The Ministry of Health has issued no such warning but a dramatic decline in supermarket sales of soy formula suggests that many parents are avoiding the product. Prof. Morgan said: "In my lectures I warn young people they may be drinking a cocktail of oestrogens and other nasties. But the babies are the ones I am scared about–the newborns who take soy formula from birth."

"At Auckland University's chemistry department Dr Mike Fitzpatrick has 25kg of soy flakes awaiting study. In 1994 Fitzpatrick was one of four New Zealand scientists who asked the Ministry of Health to warn the public of possible health risks from soy products.

"Then working as an analytical chemist for a private company, Fitzpatrick did a commissioned analysis of soy foods and a survey of the scientific literature on soy toxins.

"After reviewing Fitzpatrick's work in 1994, Auckland Medical School senior toxicologist Dr Iain Robertson recommended that the use of soy in infant formula be discontinued pending future research."

"Figures from the international marketing research group A.C. Nelson for supermarket sales of soy infant formula show that New Zealanders spent $1.6 million on these products over the past year–a 30 per cent decline on the previous year.

"Soy formula used to claim a 16 per cent share of the infant formula market. That share has shrunk to less than 9 per cent."

A photo shows Prof. Morgan with the caption "soy toxins are very active and scary stuff."

1469. James, Richard. 1996. Soy dangers (Letter to the editor). *Northern Advocate (Whangarei, New Zealand).* June 25.
• ***Summary:*** "I would like to comment on the statement by the Ministry of Health regarding soy-based products.

"Soy formulas are still on general sale in pharmacies and supermarkets, and they are being used without medical supervision: doctors have been given no notification of the ministry's position."

Dr. Edwards, of the ministry, stated in a published report that "'soy based formulas have been on the market for 30 years and there have been no reports in scientific literature about it having harmful effects on infants.'

"The truth is that they were on the market in the US in the 1930s and reports of adverse effects (eg from the Mayo Clinic) were immediate.

"Since 1932 there have been dozens of published medical papers demonstrating adverse effects–especially thyroid dysfunction, growth depression... all evidence of excess oestrogen." Address: Whangarei, New Zealand.

1470. Hattersley, Joseph G. 1996. Sudden infant death–Linked to soy products, processed milk & milk formulas. *Australasian Health and Healing* 15(3):46-48.
• ***Summary:*** Much of his information is based on an article by Sally W. Fallon and Mary G. Enig published in *Health Freedom News* (Oct. 1995, by National Health Federation, Monrovia, California).

1471. Colborn, Theo. 1996. Re: Cases of hypothyroidism in horses, dogs, and people due to exposure to insecticides and herbicides. Letter to Mr. Richard James at Whangarei, New Zealand, July 18. 1 p. Typed, with signature on letterhead.
• ***Summary:*** The World Wildlife Fund is convinced that animals are suffering from exposure to insecticides and herbicides that affect the thyroid. It is shocking to learn how much aerial and truck spraying now takes place. Address: PhD, Senior Program Scientist, World Wildlife Fund, 1250 Twenty-fourth St., NW Washington, DC 20037-1175. Phone: 202-293-4800; fax 202-293-9211.

1472. New Zealand Ministry of Health. 1996. Soy based infant formula a useful alternative (News release). New Zealand. 2 p. July 19.
• ***Summary:*** "Breast milk is best for infants. Dairy based substitute formulas can be used if needed however, and under the advice of a health specialist soy based infant formulas are a useful alternative for babies who cannot tolerate dairy based formulas, says Dr. John Eastwood, Ministry of Health Paediatrician.

"A recent statement from the Chief Medical Officer of the United Kingdom Department of Health that if your doctor or health professional has recommended that you feed your baby soy based infant formula, you should continue to do so. This is in line with the advice that the Ministry has been providing in New Zealand since August 1995."

Note: Letter from Richard James of New Zealand. 1998. This was issued to all media by the Ministry of Health (NZ) to counteract the report of the British Expert Committee on Toxicity, which the New Zealand government wished to suppress. A more thoughtful release titled "Soy infant formula: Soy formula risk?" was issued the same day by the Soy Information Network.

1473. Roberts, Rosemary. 1996. Soy milk move elates North pair. *Northern Advocate (Whangarei, New Zealand).* July 19.
• ***Summary:*** "An acknowledgement by British health authorities yesterday of a potential health risk to infants from phytoestrogens in soy milk has elated Whangarei couple Richard and Valerie James.

"Representatives of the soy industry and consumer groups were summoned to an urgent meeting in London yesterday.

"Britain's Chief Medical Officer, Sir Kenneth Calman, announced that the government's Committee On Toxicity (COT) had recommended that research be undertaken "as a matter of high priority" to determine whether soybased infant formula affected infant reproductive development."

"In the wake of the announcement, the British Department of Health's Food Advisory Committee has said manufacturers should investigate means of reducing the levels of phytoestrogens in soy-based infants formulas as a precautionary measure.

"Mr and Mrs James have been campaigning for about three years to have soy infant formula removed from the market."

1474. Soy Information Network. 1996. Soy infant formula: 'Soy formula risk?' (News release). New Zealand. 2 p. July 19.
• ***Summary:*** "The United Kingdom Department of Health yesterday recommended that research should be undertaken 'as a matter of high priority' to determine whether soya-based infant formulae create risks to the normal reproductive development of infants.

"The recommendation follows reports of a Department of Health committee of independent experts on the effects of phytoestrogens on animals and humans. The report found that phytoestrogens, or plant oestrogens, were a cause of infertility in animals, and influenced the menstrual cycle in women. It had also been shown to cause androgenisation of females and feminisation [feminization] of males in certain species. Soy beans contain high levels of phytoestrogens.

"The Committee said it did not have any data 'specifically relating to the potential effects of soy phytoestrogens in human infants.'"

"The Committee has stopped short of recommending the removal of soy formulae from the market, but recommends that it should be used only when prescribed by a doctor or other health professional. Manufacturers of infant formulae have been urged to investigate means of reducing the levels of phytoestrogens in soya-based formulae as a precautionary measure." Address: P.O. Box 100 212, North Shore Mall Centre, New Zealand.

1475. Chisholm, Donna. 1996. Soya-based baby formulas warning. *Sunday Star-Times (Auckland, New Zealand).* July 28.
• ***Summary:*** Soya-based infant formulas only on the advice of a physician, following a UK Health Department report recommending urgent research into the safety of such products, say New Zealand researchers.

"The chief medical officer of the British Health Department wants the research done 'as a high priority' to determine whether the formulas affect infant reproductive development because they contain phytooestrogens (plant oestrogens). The chemicals influence women's menstrual cycles and have been shown to cause infertility to animals."

1476. Roudybush, Tom. 1996. Misconceptions about soy. *Australian Birdkeeper* 9(3):141-43. June/July.
• ***Summary:*** For the past 3-4 years the author has had conflict with Mr. Richard James of New Zealand "about the death of some of his birds and the possibility that their deaths were due to the use of soy products in the feeds I make." Mr. James is the only person who has ever complained about this matter to the author, who subsequently did extensive research into the complaint. After attending the Third International Conference on Phytoestrogens (3-6 Dec. 1995), organized by the National Center for Toxicological Research, a part of the United States Food & Drug Administration, "I can now say with confidence that my feed had nothing to do with the deaths of the birds in New Zealand or elsewhere and that there is no evidence that soy infant formulas cause any harm to infants."

The author's company has a standard policy when such problems arise. "It states, in essence, that I will have my veterinarian contact the customer's veterinarian and allow them to work up the problem to their mutual satisfaction. No matter what the outcome, I will pay all the expenses incurred by my veterinarian. If there is a problem with the feed, I will also pay for the customer's veterinary bills and for any damages. If we are unable to solve the problem, but find no problem with the feed, we drop out of the process. In my mind this is a fair and generous policy which allows the customer to undertake relatively extensive diagnostic procedures at no cost. When I offered this policy to the couple in New Zealand, he declined and eventually cut me off from any further information on the issue. He did, however, continue to seek a public forum for his unsupported views."

The soy products in the bird feeds in question were obtained from Roudybush in California. Many other birds were fed this feed and none experienced any problems. "Soy simply wouldn't have killed one set of birds and left others in good condition. Toxins don't work that way.

"Death at his own hands: I believe we have found the cause of death of the birds. They died from a virus variously called polyoma virus, papova virus or budgie fledgling disease. This disease is consistent with all we know about the situation."

Note: See the rebuttal to this article by Valerie James in this magazine, Vol. 9, issue 5, p. 249-50, Oct/Nov. 1996. In the same issue see her letter to the editor (p. 214).

1477. Highman, Jay. 1996. Worthington's policy on licensing technology to other companies. Thoughts on building a plant overseas. New Web page under development (Interview). *SoyaScan Notes.* Sept. 3. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Worthington does not license technology to other corporations, mainly for two reasons: (1) There are many top secret techniques used in the technology, and, (2) The company is focusing all of its resources (money and attention) on keeping up with demand in the domestic market. They do a large export business, to countries such as Taiwan and the United Kingdom. Not much is exported to Australia because Sanitarium Foods makes similar products there.

Worthington is not considering construction of an overseas plant (as in England) because the domestic market is their first priority. "We're having a hard time keeping up with demand." Jay thinks there is a big market in the UK, and there could be a long-term opportunity there. Roughly 60% of the reason for not looking overseas is related to money and the other 40% would be the loss of focus from trying to do two things at once.

Worthington is developing a web page; Jay is in charge of it. He would to have a cross-link with Soyfoods Center. Address: Senior Manager of Marketing and Sales for the specialty markets, Worthington Foods, 900 Proprietors Rd., Worthington, Ohio 43085. Phone: 614-885-9511.

1478. Guy, Camille. 1996. Frankenfood on menu: Compliments to the prof–Are we the unwitting guinea pigs for genetically re-designed food? *New Zealand Herald.* Sept. 24.

• ***Summary:*** "New Zealand consumers will be eating genetically modified food by Christmas... As the first shipments of a Roundup-resistant soybean crop leave America, food campaigners warn that the beans will go into so many foodstuffs that few will avoid eating them. They say the beans carry health and environmental risks.

"Our Ministry for the Environment, attempting to discover just who will be bringing Roundup Ready beans into the country, says there is no New Zealand precedent for monitoring what as been dubbed 'Frankenfood.'"

To date, no New Zealand company has sought or obtained permission to import genetically engineered soybeans, yet American agricultural authorities say that these soybeans comprise up to 5% of this season's harvest and cannot be separated from traditional unmodified soybeans."

The soybeans have been genetically engineered by Monsanto so that farmers can spray Roundup weed killer (also made and sold by Monsanto) on the soybean crop without damaging–selectively killing only the weeds.

Last year over 350,000 kg of soybeans and 49 million kg of soyflour were imported to New Zealand. Some of these soybeans go into self-proclaimed soy foods like tofu and soy milk.

1479. Stein, Jill. 1996. Possible tofu link to Alzheimer's disease. *New Zealand Doctor.* Oct. 2. [2 ref]

• ***Summary:*** "Contrary to what might be expected, men who consume consistently high levels of tofu in mid-life appear to be at increased risk of Alzheimer's disease (AD) in late life.

"This finding follows research by a group from the National Institutes of Health and the University of Hawaii."

"'We know that, in addition to their superior nutrient content, soybean foods may contain significant amount of isoflavone molecules that can alter the metabolism of brain cells sensitive to normal to oestrogens,' chief of the Asia-Pacific Office of Epidemiology, Demography and Biometry Program at the National Institute on Aging, Lon White says.

"'We worry that these molecules, which may have other important health benefits, could have an adverse impact on brain aging.'"

1480. Tuchy, Pat. 1996. Re: Safety of soy-based infant formula. Letter to Professor J. Mann, Chairman, Food and Nutrition Committee, Ministry of Health, Box 5013, Wellington, New Zealand, Oct. 15. 1 p. Typed, with signature. [1 ref]

• ***Summary:*** "Dear Prof. Mann: I am writing on behalf of the Royal New Zealand Plunket Society to request that the Food and Nutrition Committee review its current position on soy infant formula in the light of the recent United Kingdom on Toxicology report, and concurrent advice to UK Health Practitioners."

"The Plunket Society believes that there is no conclusive evidence that soy infant formula is harmful to infants, but there is no doubt that a number of regulatory agencies, including the NZ Ministry of Health is aware that there are endogenous estrogenic agents in soy formula which have unknown but real potential to cause harm. If the formula was know to be contaminated exogenous estrogens at this level would the Ministry act any differently?" Address: Royal New Zealand Plunket Society (Inc.), New Zealand.

1481. James, Valerie. 1996. The implications of feeding soy: Facts about the "New Zealand situation". *Parrot (Parrot Society of New Zealand)* 2(4):34-40. Oct.

• ***Summary:*** A very detailed report on what happened to exotic parrots fed a formula containing soy and how the Jameses researched the causes of death. Contents: Editor's note. 1. Preliminary enquiries. 2. Suspect soy. 3. The case to be answered. 4. Presentation of evidence–How safe is soy. 5. In summing up. 6. My own verdict. 7. Footnote.

"1. Preliminary enquiries: In the lengthening days of early summer of '92 our dream of keeping and raising exotic and native birds, one which we had enjoyed for several years, became a nightmare when the chicks I raised on a commercial food began to sicken and die (although the chicks I raised on my own formulation thrived). The symptoms were varied and unusual, but we did not suspect the food for several months because it was promoted as scientifically developed.

"The autopsies of our birds and those of others whose birds had been fed the same food, indicated an immune system breakdown with the resultant multiple organ failure and a lethal multiplication of the birds' own normally benign bacteria. Survivors often had poor muscle control, poor or unusual feathering or matured prematurely. Some were also aggressive or displayed inappropriate sexual behaviour.

"Because we were advised that the symptoms of haemorrhaging, vomiting, respiratory problems, liver disease, and immune suppression were likely to be caused by food contamination by either a rodent poison (warfarin type) or a fungal toxin (such as zearalenone) food samples were sent, by us and others, to several laboratories for analysis. The two New Zealand laboratories reported that, although in amounts varying greatly between samples, every food sample appeared to contain rat poison. We were all shocked!! But we were relieved to have an answer and so we put the manufacturer in touch with the New Zealand analytical chemists expecting that the remaining stocks would be withdrawn."

"Further analysis led to a report that the suspect food contained a structure which was almost identical to coumarin, upon which most modern rodent baits are based. Coumarin, although once allowed in small amounts, as an aromatic flavour enhancer in human foods, was long ago banned by the US Federal Food and Drug Administration when it was shown to be cumulatively toxic when fed to animals, causing them to die. In 1944 coumarin was synthesised into Warfarin, the first of the rodent poisons to cause death by reducing the body's ability to produce Vitamin K and consequently inducing fatal haemorrhaging. This lethal effect of coumarin was first discovered in the 1930s when the haemorrhagic death of many Canadian cattle being fed spoiled sweet clover silage was attributed to the naturally occurring coumarin in the food." Address: Whangarei Heads, New Zealand.

1482. Longa Life Vegetarian Products Pty. Ltd. 1996. United States Products: Dietary information and product information (Leaflet). Yatala, QLD, Australia. 2 p.
• ***Summary:*** This photocopied black-and-white leaflet gives dietary, nutritional, and ingredient information on the following products: Notchicken, Notham, Notbacon, Notpepperoni, and Notchicken Nuggets. All are vegetarian and free of MSG. The first two are vegan, egg free, and dairy free. All are Halal (like kosher for Moslems). Two contain less than 0.3% gluten. In the first two products, the main ingredient is wheat gluten; in the others it is soy protein.

The U.S. distributor for these products is: United Specialty Foods Inc., 2475 Bransford Ave., Nashville, Tennessee 37204. Phone: 615-269-7476. Talk with Don Michalenko, founder and head of United Specialty Foods. 1997. April 4. He was with Worthington Foods for 8 years as national sales manager for their natural foods line. Longa Life Foods started about 10-12 years ago by a man who was a butcher, who became a Seventh-day Adventist and a vegetarian. People encouraged him to start line of meatlike vegetarian products. The managing director is an entrepreneur and the butcher is still one of the partners. Address: 6 Binary St., Yatala (near Brisbane), QLD 4207, Australia. Phone: +61 7 3807-2433.

1483. Essex, Charles. 1996. Questions remain over soy milk infant formula. *New Zealand Doctor.* Nov. 27.
• ***Summary:*** "The adverse publicity surrounding soy-based formulas has had a significant effect on their sales in some countries. Soy formulas in New Zealand have fallen from about 13 per cent of the formula market in 1994-95 to around 5 per cent, although soy follow-on formula has risen from 0.8 per cent of the market to 1.3 per cent. This is because use of infant formula has risen in infants over six months of age as parents have delayed the introduction of whole cow's milk.

"Sales of other soy products, for the adult health food market, have also fallen recently in New Zealand because of the concerns which have arisen without satisfactory scientific evidence about the effects of soy in the human diet."

1484. Inge, Margaret. 1996. Healthy interest in legal matters medical. *New Zealand Doctor.* Nov. 27.
• ***Summary:*** Wellington Barrister Michael Okkerse, who became well known for defending women who claimed to have been injured by the Dalkon Shield IUD contraceptive device, is now one of a group of concerned scientists who are working without pay and are "attempting to make soy infant formulas available only by prescription."

1485. James, Valerie A. 1996. Experience and reason together. *Australian Birdkeeper* 9(5):249-50. Oct/Nov.
• ***Summary:*** This article is a rebuttal to a previous article in this magazine (June/July 1996, p. 141) by Tom Roudybush, whose company manufactures bird feed. She argues that the article by Roudybush was almost completely false and summarizs many studies from around the world, from the 1930s to the present, showing that soybeans contain toxins that are harmful or potentially harmful. Address: Whangarei, New Zealand.

1486. James, Valerie A. 1996. Re: Response to article "Misconceptions About Soy," by Tom Roudybush in June/ July 1996 issue (Letter to the editor). *Australian Birdkeeper* 9(5):214. Oct/Nov.
• ***Summary:*** Explains a rebuttal (see p. 249-50 of this issue) to a previous article in this magazine (June/July 1996, p. 141) by Tom Roudybush, whose company manufactures bird feed. "In New Zealand alone, there were more than 30 aviculturists who experienced problems with soy based bird foods and a number of them complained direct to the manufacturers (see 'Anatomy of and Investigations' by Dr. D.J. Woodhams, *Proceedings of Nutritional Society of New Zealand,* 1995) and not once was a Papovirus suggested as a cause by either Dr. Roudybush or any of the consulting veterinarians." At the Third International Conference on Phytoestrogens at Little Rock, Arkansas, Prof. Cliff Irvine presented a paper in which he raised concerns about the levels and potential developmental problems of phytoestrogens in soy infant formulas. Dr. Daniel Sheehan, head toxicologist at the National Center for Toxicological Research of the U.S. FDA, also stated his concerns at the conference. "He had stated earlier (Journal of the National Cancer Institute 1994) that 'I disagree that soy has been proven safe,' and more recently said, (National Institute of Environmental Science, USA), 'Estrogens are clearly a two-edged sword in humans... with developmental toxicants

there is a long latency period which makes it difficult to associate an event with a negative outcome.'"

In a follow-up letter to Soyfoods Center (May 1998) Valerie James adds further rebuttal: "(1) Many veterinarians were consulted, including vets at the only veterinary school in New Zealand. They regard our birdkeeping skills highly enough that students are assigned to us for 'practical' studies. (2) Autopsies *were* done. (3) When birds fed Roudybush were taken off that food, their health improved and some are still alive. When birds previously fed other foods were put onto Roudybush *(that* batch) they sickened and died." Address: Whangarei, New Zealand.

1487. *Northland Age (New Zealand).*1996. Soybean fears vindicated at last. Dec. 12. Thursday.

• ***Summary:*** "Environmental activists' alarm over the possibility of genetically altered soybeans entering New Zealand has vindicated fears expressed by Kaitaia cage bird breeder Gerard McIntyre for more than a decade.

"Mr. McIntyre said soybean feed which he used in 1982 had a disastrous impact on his younger birds, and while some older individuals recovered the majority died a grisly death.

"He had no idea what the problem was, and did not consider the possibility of the feed being responsible..."

"A month later he began receiving telephone calls from breeders all over the country, however, reporting identical problems–one Whangarei breeder lost some $200,000 worth of birds, the common link being soybean feed.

Mr. McIntyre said exhaustive testing of the feed initially produced the finding that a rat poison was present, experts later establishing that soybeans naturally contain a toxin which is identical to that substance.

"The challenge for manufacturers of animal and human foods using soybeans, he said, is to process the beans to the point where the toxin is rendered harmless, without carrying the process too far and thereby totally eliminating any nutritional value.

"Mr. McIntyre insisted that testing in New Zealand and the United States has proved the nature of the problem beyond all doubt, but that has not deterred food manufacturers.

"He no longer feeds his birds with anything that contains soybeans..."

"A new issue is genetically engineered soybeans that are resistant to the herbicide Roundup."

1488. Fukutake, M.; Takahashi, M.; Ishida, K.; Kawamura, H.; Sugimura, T.; Wakabayashi, K. 1996. Quantification of genistein and genistin in soybeans and soybean products. *Food and Chemical Toxicology* 34(5):457-461.

• ***Summary:*** Discusses: Soybeans, soy nuts, soy powder, soymilk, tofu, miso, natto, soy sauce, genistein. Address: 1-3,5-6. Biochemistry Div., National Cancer Center Research Inst., 1-1 Tsukiji, 5-chome, Chuo-ku, Tokyo 104; 1,4. Tsumura & Co., 3586 Yoshiwara, Ami-cho, Inashiki-gun, Ibaraki 300-11. All: Japan.

1489. **Product Name:** Tonzu Organic Tofu [Natural].
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 1996.
Ingredients: Certified organic soybeans (guaranteed to be non-genetically modified), filtered water, natural coagulant nigari (511).
Wt/Vol., Packaging, Price: 275 gm, vacuum packed inside paperboard box.
How Stored: Refrigerate at 4ºC or less.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 1996, but it was first sold in this paperboard box in 2001. They started using the Tonzu brand name in 2002. Color photo of snowy mountains beyond a deep green valley, on deep blue background. Superb label design. GE [Genetically Engineered] Free logo. Certified Organic logo.

1490. **Product Name:** Soya King Soya Chips [Original, Taco Flavor, Sour Cream & Onions, Mongolian B.B.Q.].
Manufacturer's Name: Tixana Pty. Ltd.
Manufacturer's Address: Sydney, NSW 2194, Australia.
Date of Introduction: 1996.
Ingredients: Original: Soybeans, corn starch, canola oil, dreid garlic, salt, dried wheat, chives.
Wt/Vol., Packaging, Price: 6 oz or 1.2 oz.
How Stored: Shelf stable.
New Product–Documentation: Leaflet (8½ by 11 inches, color photocopy) brought by Patricia Smith from Natural Products Expo at Anaheim. 1997. March.

1491. **Product Name:** Tofu.
Manufacturer's Name: Tofu Shop Ltd.
Manufacturer's Address: 89 Dominion Road, Mt. Eden, Auckland, New Zealand.
Date of Introduction: 1996.
New Product–Documentation: Letter (fax) from Yoshinori Ito of Takai Tofu & Soymilk Equipment Co. 1996. April 24. Names and addresses of new tofu shops in countries where tofu is not well known. Mr. Ron Hoy Fong is the owner.

1492. Palmer, R.G.; Hymowitz, T.; Nelson, R.L. 1996. Germplasm diversity within soybean. In: D.P.S. Verma and R.C. Shoemaker, eds. 1996. Soybean: Genetics, Molecular Biology, and Biotechnology. Wallingford, England: CAB International (Commonwealth Agricultural Bureaux). x + 270 p. See p. 1-36. Chap. 1. [234 ref]

• ***Summary:*** Contents: Introduction. Germplasm–Subgenus *Soja*. Germplasm–Subgenus *Glycine*. Germplasm–Characterization of diversity: Soybean breeding and loss of diversity, diversity for 'yield' traits within *G. max*, diversity for value-added traits within *G. max*, diversity for pest resistance/tolerance within *G. max*, diversity for physiological traits within *G. max*, soybean breeding and use of *G. soya*, diversity for cytogenetic and molecular traits within *G. max* and *G. soja*. Conclusions.

The introduction states: "There are more than 100,000 *Glycine max* accessions, probably less than 100,000 *Glycine soja* accessions, and approximately 3,500 accessions of perennial *Glycine* species in germplasm collections throughout the world. Inasmuch as the only worldwide survey of soybean collections is a decade old (Juvik et al., 1985), the exact numbers are unknown. Major *Glycine* collections exist in Australia, Brazil, China, Germany, India, Indonesia, Japan, Russia, South Korea, and the United States. Many other smaller but important collections exist throughout Asia and Europe."

Tables show: (1.1) List of species in the genus *Glycine* Willd., three-letter code, 2n, standard (PI), genome symbols and distribution. (1.2) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection from China. (1.3) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection from Japan. (1.4) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection from South Korea. (1.5) Origin and number of accessions of *Glycine soja* in the USDA Soybean Germplasm Collection by country and maturity group. (1.6) Origin and number of accessions of *Glycine max* in the USDA Soybean Germplasm Collection. (1.7) Number of accessions of *Glycine max* in the USDA Soybean Germplasm Collection by maturity group. (1.8) Representative examples of plant introductions and their descendants used in pest reaction studies in soybean (19 references from 1951-1992). (1.9) Representative examples of plant introductions and their descendants used in qualitative genetic studies in soybean (34 references from 1918-1992). (1.10) Representative examples of plant introductions and their descendants used in protein and isozyme studies in soybean (13 references from 1977-1992).

Figures show: (1.1) Summary of genomic relationships based on cytogenetics and seed protein profiles among 11 of the 16 wild perennial species of the subgenus *Glycine*. Address: 1. United States Dep. of Agriculture, Agricultural Research Service, FCR and Dep. of Agronomy and Zoology/Genetics, Iowa State Univ., Ames, IA 50011; 2. Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801; 3. USDA-ARS and Dep. of Agronomy, Univ. of Illinois, Urbana, IL 61801.

1493. Seubsman, Sam-ang. 1996. A trial social marketing of fermented whole soybean (tempe) for complementary feeding of infants among mothers in Jakarta. PhD thesis, University of Queensland, Australia. 351 p. Illust. 30 cm. *
• ***Summary:*** Includes bibliographic references. Address: St Lucia, Queensland, Australia.

1494. Solomon, Charmaine. 1996. Charmaine Solomon's encyclopedia of Asian food. Port Melbourne, Australia: Reed Books. xiv + 480 p. Color illust. ([28] p. of plates). 29 cm. *

1495. Soya World Inc. 1996. So Good–Dairy free beverage: 5 easy to make, nutritious recipes. Product information guide (Leaflet). Vancouver, British Columbia, Canada. 12 panels. Front and back. 16 cm.
• ***Summary:*** This attractive full-color leaflet is folded into 16 panels. Contents: The story of So Good. Five recipes and color photos. The So Good family of soy beverages. Tips for using So Good. The ingredients in So Good: Filtered water, soy protein, vegetable oil, maltodextrin, rice extract, fructose, cane sugar, mineral salts (calcium phosphate, potassium phosphate), food acid (potassium citrate), flavours.

Why choose so good? (Nine reasons, incl. contains up to 9.3 gm of protein per 250 ml serving). Nutritional information for each of the five flavors: Original, Fat Free, Absolutely Vanilla, Utterly Chocolate, and Seriously Strawberry.

Note: This products are made by Soya World Inc. under license from the Sanitarium Health Food Company, New South Wales, Australia. Address: P.O. Box 3018, Vancouver, BC V6B 3X5, Canada. Phone: (604) 420-3240.

1496. Nguyen, Q.V. 1997. Production of vegetable green soybean for the domestic market and trial shipments to Japan. Barton, ACT, Australia: Rural Industries Research and Development Corporation. ii + 43 p. Jan. Illust. 30 cm. Series: RIRDC Research Paper No. 97/8. *
• ***Summary:*** A report for the Rural Industries Research and Development Corporation by the Horticultural Research and Advisory Station, NSW Agriculture, principal investigator, Q.V. Nguyen. Address: Barton, ACT, Australia.

1497. Kollipara, Krishna P.; Singh, R.J.; Hymowitz, T. 1997. Phylogenetic and genomic relationships in the genus *Glycine* Willd. based on sequences from the ITS region of nuclear rDNA. *Genome* 40(1):57-68. Feb. [53 ref]
• ***Summary:*** "Phylogenetic relationships among all 18 species of the genus *Glycine* were inferred from nucleotide sequence variation in the internal transcribed spacer (ITS) region of nuclear ribosomal DNA. Pairwise sequence divergence values ranged from 0.2% (a single nucleotide) between *Glycine max* and *Glycine soja* to 8.6% between

Glycine hirticaulis and *Glycine falcata*... Phylogenetic analyses of the ITS region clearly resolved all the genomic groups that were established previously based on cytogenetic and biochemical studies."

"The subgenus *Glycine* contains 16 wild perennial species. They are indigenous to Australia and grow in diverse geographical areas under a wide range of climatic conditions. All these species are diploid ($2n = 40$), with aneuploidy ($2n = 38$ and 78) and tetraploidy ($2n = 80$) occurring in *Glycine tomentella* Hayata and tetraploidy occurring in *Glycine tabacina* (Labill.) Benth. and *Glycine hirticaulis* Tind. & Craven.

Early researchers to use molecular studies to establish genomic relationships among the wild perennial *Glycine* species were Doyle et al. (1990a, 1990b) and Zhu et al. (1995). "Genome symbols were assigned to 11 of the 16 wild perennial species based on the results of cytogenetic studies (Table 1). Because of difficulties associated with growing the plants and inducing flowering at Urbana, Illinois, determination of the genomic relationships of the five relatively recently described species, *Glycine albicans* Tind. & Craven, *Glycine arenaria* Tind., *Glycine hirticaulis, Glycine lactovirens* Tind. & Craven, and *Glycine pindanica* Tind. & Craven,... using cytogenetic studies was not possible. This prompted us to explore various biochemical and molecular methods to study the genomic relationships of these species among themselves and also with the species of the subgenus *Glycine.*"

Molecular approaches, such as restriction site variation in chloroplast (cp) DNA (Doyle et al. 1990a, 1990b) and DNA sequence variation of a nuclear restriction fragment length polymorphism locus, A-199a (Zhu et al. 1995), have previously been used to infer phylogenetic relationships among the *Glycine* species."

"Recent studies have demonstrated that nucleotide sequences of the internal transcribed spacer (ITS) region between the small nuclear ribosomal (nr) DNA subunit (SS or 18S) and the large subunit (LS, 25S, or 26S) are very useful for phylogenetic studies in many angiosperm groups... In this study we sequenced the ITS region of the nrDNA of all known species of the genus *Glycine*... The nucleotide sequence of the ITS region was used to reconstruct the phylogeny of the genus *Glycine.* Based on phylogenetic relationships, we assigned new genome symbols:" H H to *Glycine arenaria*, H1 H1 to *Glycine hirticaulis*, H2 H2 to *Glycine pindanica*, I I to *Glycine albicans*, and I1 I1 to *Glycine lactovirens.*

"Parsimony analysis of the entire ITS region, using subgenus *Soja* as outgroup, resulted in a trichotomy consisting of the clades: *G. falcata* (F genome), *Glycine cyrtoloba* and *Glycine curvata* (C genome), and all other species (A, B, D, E, H, and I genomes) of the subgenus *Glycine.*

Fig. 3 shows the strict consensus tree, with bootstrap and decay values. "The six most parsimonious trees with equal length of 176 steps obtained from equally weighted parsimony analysis, using the Branch-and-Bound option of the PAUP program, of the entire unambiguously aligned ITS region shown in Fig. 2."

Fig. 5 shows the phylogenetic tree obtained from the maximum likelihood analysis using fast-DNAML program... Address: Dep. of Crop Sciences, Univ. of Illinois, 1102 South Goodwin Ave., Urbana, IL 61801.

1498. Messina, Mark. 1997. Summary of findings: Menopause relief. *Soy Connection (The) (Jefferson City, Missouri)* 5(1):3. Winter. Special edition: Highlights of the *Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.* [4 ref]

• ***Summary:*** "One hypothesis that appears with increasing frequency in the media is that soy foods may be useful in relieving menopause symptoms such as the inability to regulate body temperature which often manifests as night sweats and hot flashes. In support of such speculation is the reported low incidence of symptoms among Japanese women and the estrogenic effects of isoflavones. Much of the data presented at the symposium were preliminary and inconsistent.

"Research presented by Dr. Margo Woods and colleagues from Tufts University, and Dr. Fabian Dalais and colleagues from the Monash Medical Center in Australia suggest that, at best, soy has relatively little effect on the frequency of hot flashes. In contrast Dr. Claudia Harding, from the University Hospital of South Manchester, United Kingdom, indicated that the consumption of soyfoods providing 80 mg of isoflavones per day reduced the frequency of hot flashes ($P < 0.03$).

"Work presented by Dr. Gregory Burke and colleagues, from Bowman Gray Medical School [North Carolina], indicated that soy modestly reduced the severity of menopausal symptoms although frequency was not affected. (This research was highly publicized after it was also presented at the American Heart Association meeting on Nov. 9 [1996]).

"Upon the basis of the existing data, it is difficult to reach any definitive conclusions about the effects of soy intake on menopause symptoms. Several studies addressing this issue are currently underway. Soon it should be possible to make more definitive conclusions about the effects of soy on hot flashes." Address: PhD, Symposium Chairperson, Port Townsend, Washington.

1499. Messina, Mark. 1997. Summary of findings: Osteoporosis. *Soy Connection (The) (Jefferson City, Missouri)* 5(1):4. Winter. Special edition: Highlights of the *Second International Symposium on the Role of Soy in Preventing and Treating Chronic Disease.* [4 ref]

• ***Summary:*** "The similarity in chemical structure between the soybean isoflavones and the anti-osteoporosis drug ipriflavone has prompted speculation that isoflavones may promote bone health. Until recently, however, there have been relatively little data in support of such an effect. Four animal studies and two human studies reported in Brussels [Belgium] strongly suggest a role for soy/isoflavones in inhibiting bone resorption, stimulating bone formation or both, although all of this work should still be considered preliminary.

"Dr. Bahram Arjmandi and colleagues from the University of Illinois found that a diet containing soy helped minimize bone loss in ovariectomized rats although soy was not effective in reversing bone loss when soy treatment was begun 35 days after surgery. Dr. John Anderson and colleagues from the University of North Carolina reported that in ovariectomized rats, at optimal concentrations genistein administration results in an equivalent percentage bone retention as estradiol. Work presented by Dr. Henry Blair and colleagues from the University of Alabama suggests that genistein inhibits bone resorption by inhibiting tyrosine kinase activity and that in vivo, the inhibition of bone resorption occurs at concentrations that are considerably less toxic than other agents that inhibit bone resorption. In contrast to the work of Dr. Blair, research by Dr. Paolo Fanti and colleagues from the University of Kentucky suggests that genistein inhibits bone loss in ovariectomized rats by stimulating bone formation, rather than by inhibiting bone resorption.

"Dr. John Erdman and colleagues from the University of Illinois presented the results of a six month feeding study involving three groups of postmenopausal women. Women received a diet without soy, a diet containing soy that provided a moderate amount of isoflavones, or a soy-containing diet that provided a high amount of isoflavones. Women in the group consuming the diet highest in isoflavones experienced an increase in bone mineral density and bone mineral content in the lumbar spine whereas the other two groups experienced a decrease. These results are consistent with results from a study of postmenopausal women conducted by Dr. Fabian Dalais and colleagues from the Monash Medical Center, Australia. They found that after 12 weeks of soy consumption, bone mineral density had increased compared to the initial values.

"New soy products enter the marketplace seemingly every week and the accompanying promotion efforts often go well beyond the data. As research on soy continues to accumulate, and consumer interest in soy foods increases, it is incumbent upon the nutrition community to be able to separate the hype from the data.

"Of course it is not realistic to expect most nutritionists to become soy experts. Perhaps the following points may help to put soy foods in perspective. First, on the basis of their nutrient profile alone, soy foods warrant a bigger role in the American diet. Second, the phytochemical composition of soybeans makes them unique. Third, in many respects, soy research is still in its infancy although the pace of investigation is quickening. Finally, evidence related to the effects of intake on chronic disease risk ranges in quality from fairly speculative to fairly solid. The relationship between soy intake and cancer risk is quite speculative, whereas, solid research indicates soy protein when consumed in sufficient quantities lower LDL-cholesterol in hypercholesterolemic individuals. Animal studies and human research suggest soy / isoflavones promote bone health. The data are still preliminary, but this area of research holds tremendous potential. The question of menopausal symptom relief remains an open one, although it certainly is reasonable for women to try soyfoods for relief of symptoms related to menopause. Within the next 12-18 months, the effectiveness of this approach will be better understood." Address: PhD, Symposium Chairperson, Port Townsend, Washington.

1500. Wight, Karen James. 1997. Work with tempeh and tofu at Homeland Foundation in Australia (Interview). *SoyaScan Notes*. March 12. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Karen arrived at Homeland Foundation in Australia in either late December 1981 or early 1982 (she no longer has her passport from that era). She lived in Australia for 6½ months, during which she lived at Homeland Foundation for 3½ months. Homeland was located at Upper Thora, in the Bellingen Valley, about 40 miles inland from Coffs Harbour, near the east coast of New South Wales. The area was incredibly lush, green, and fertile.

She left southern California in August 1981 (after leaving a professorship at UCLA), spent 2 months in Hawaii studying body work, then flew to Sydney (the capital of New South Wales), arriving in about October 1981. She met Jonathan Gordon at a community in a hotel just outside of Sydney, where they stayed for about a month. Then they stayed at a community in Victoria for about 1 month. They spent Christmas in Melbourne–where the only thing offered to eat was meat. Then they went directly to Homeland. They wanted to go there because Jonathan had been to Findhorn (a spiritual community in northern Scotland), and he knew some of the Findhorn people who had started Homeland.

Karen is sure the company that made tofu, tempeh and sprouts (mainly alfalfa and mung bean sprouts; no soy sprouts) had a name (but she cannot remember what it was) because they sold products commercially outside the community in order to earn income for Homeland Foundation. The equipment was new and gorgeous; the sprouting room was very modern, sanitary, and well organized. The company made good use of the okara–a by-product from making tofu; they used it to make delicious okara granola and soysage. These two products were consumed mostly in the community and by friends; they were not sold.

Karen has no idea when Homeland was established or when they started to make tempeh and tofu. She would guess they had been making and selling soyfoods for at least a number of months, and perhaps a year or two. She thinks it is fairly likely that they were making tempeh by January 1981. They had clearly built it into a very productive and well-organized operation. Karen is quite sure that they started making tempeh after tofu production was well established.

The tofu and tempeh were made in the same small room, but each was made by different people; Karen made tofu more than tempeh. They made tempeh in an incubator that was the size of a refrigerator–about 30-40 pounds at a time, approximately twice a week. Tofu was made daily. Only soy tempeh was made. They may have learned both the tempeh and tofu processes from one of the many people who came regularly from Findhorn. The various people who were head of the community had all been to Findhorn. Karen remembers getting up at 2:00 in the morning to make tempeh. She wishes Jonathan would write a book about spirituality, service, cooking, and food. Address: 2333½ Rodriguez Rd., Santa Fe, New Mexico 87501. Phone: 505-982-4765.

1501. Wenley, Sally. 1997. Caution over soy products. *G.P. Weekly.* March 17. [1 ref]

• ***Summary:*** "'I believe that feeding soy formula is risky.' This is from David Woodhams, a food consultant in Auckland, who is adamant that many soya products have potential dangers.

"'Feeding soy infant formula and follow-on foods to a normal baby is such that the Ministry of Health ought to make those accessible by prescription only,' he says." Dr. Woodhams is concerned because phytoestrogens in soy products are physiologically in humans.

"The soya issue is being dragged into the spotlight after Professor Bob Elliot's claims that protein from cows' milk can trigger diabetes in up to five percent of the population."

1502. Fairbrother, Anthony; Petterson, David. 1997. *Tempe*–a nutritious food for developing countries. *Food Chain (Intermediate Technology, England)* No. 20. March. p. 13-15.

• ***Summary:*** A good introduction to tempeh and its production in developing countries. Contains recipes for Tempe Goreng and Tempe Bacem. Photos show: (1) Four cakes of finished tempeh of different sizes. (2) People packing inoculated soybeans into small plastic bags of 200 gm each. (3) Tempeh being made in long plastic tubes, 3 cm in diameter; when done, these are cut into ½ kg and 1 1g portions. Address: 1. Curtin Univ. of Technology, GPO Box U 1987, WA [Western Australia] 6001, Sydney, Australia; 2. Agriculture Western Australia, Baron-Hay Court, S. Perth, WA 6151, Australia.

1503. New Zealand Nutrition Foundation. 1997. Soy foods in human nutrition: A position paper of the New Zealand Nutrition Foundation. New Zealand. March. *

• ***Summary:*** There is no scientific evidence that isoflavones can cause harmful effects in children.

1504. Terubea, Toani. 1997. Re: Soybeans have never been cultivated in Kiribati. Letter (fax) to William Shurtleff at Soyfoods Center, April 7–in reply to inquiry. 1 p. Typed, with signature on letterhead.

• ***Summary:*** On 23 March 1996 William Shurtleff wrote the Chief Agricultural Officer to ask if there was any record of the soybean having been cultivated in Kiribati. The response, a year later: "Actually the CAO was very busy with other commitments so this was passed on to me for action. In answer to your query, Soya bean *(Glycine max)* has never been grown in Kiribati. This may be due to our unfavourable climatic conditions. There is no mention in any text of trials carried out by the Divisional Crops Research Officers." Address: Agricultural Officer, Div. of Agriculture, Ministry of Natural Resources Development, Government of Kiribati, P.O. Box 267, Bikenibeu, Tarawa, Republic of Kiribati. Phone: 28096.

1505. Hymowitz, Ted. 1997. Recent important discoveries related to wild perennial relatives of the soybean, and progress on the Samuel Bowen book (Interview). *SoyaScan Notes.* April 15. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Ted called to explain why, because of exciting research during the past 3½ years on wild perennial relatives of the soybean, he has not made much progress in writing his two forthcoming books on: (1) The life of Samuel Bowen, and (2) The early history of the soybean. For posterity, Ted has willed his entire collection of Samuel Bowen materials to the Georgia Historical Society.

Ted and his coworkers will be publishing a number of articles based on their research with wild perennial Glycine species. It looks like they have transferred resistance to soybean cyst nematodes from wild perennial species, and there may be many other genes in the wild species which could offer major protective benefits to the soybean. The genetic approach, as described in the recent article in *Genome* (Feb. 1997) gives information that is consistent with other earlier approaches. Moreover, Ted's group has great control over their results because they are using known material with known SPI numbers.

When Ted began this work in the late 1960s, there were only 5 known wild perennial species and a total of 65 accessions in the USDA germplasm collection. Since then they have greatly expanded their knowledge in this area. One major discovery is that the diversity in the wild perennials roughly 100 times as great as that in *Glycine max*. The basic idea is to transfer economically valuable traits from the wild perennials to Glycine max. Once the trait is in any cultivar of *Glycine max*, it can easily be transferred to any others. This approach, using wide crosses but based on traditional genetics, is much simpler than the transgenic (pronounced trans-JEEN-ik) approach, where breeders face many obstacles, from Greenpeace and consumers to the FDA. And the potential looks great. For example, a researcher at Cornell University crossed a cultivated tomato with a wild ancestor of the tomato that was a little runt of a plant from Brazil. He was amazed to discover that he had transferred a gene for fruit color that gave the tomato a very appealing red color; but more important he had also transferred a gene for higher yield. There was no way to know that such a gene existed. The same could apply to the wild perennial ancestors of the soybean. The possibilities are huge and limitless–and they could break the business of soybean breeding wide open. Some of Ted's colleagues are buying stock in Monsanto, in the belief that Roundup Ready soybeans and other transgenic crops are the wave of the future, but Ted thinks that the transgenic approach may end up offering little real benefit to the farmer.

For the last 3½ years Ted's research has focused on the wild perennial species, so he has not been able to make much progress on his books on Samuel Bowen and on the history of the soybean. He has organized his documents, computerized them, and drawn up an outline for the Bowen book.

A new wild perennial species has been found. Ted saw a specimen in Australia. To find it, one must fly into a remote part of Western Australia by helicopter. Mary Tindale in Australia will be given the responsibility for naming it.

One upcoming project is to travel to Vietnam and the former Indochina to look for ancestors of the ancestors of the soybean. But one big obstacle to field research is the presence of many landmines left over from recent wars there. The ancestors of the wild perennial Glycine species must have come from Southeast Asia. This goes back to plate tectonics. When the Australian plate rammed into the Southeast Asian plate, they jumped onto a the Australian plate, where there was little competition, except from primitive plants. Therefore it was a fertile area for these wild perennials to thrive. There were no legumes on the Australian plate before the collision, since it had moved from a very cold part of the Earth, through a dry area. All this research will help push back and explain the very early history of the soybean and its genus.

Two interesting questions which were not discussed in the *Genome* article but which Ted and his colleagues are now addressing are: (1) Which of the wild perennial species is closest to the soybean genetically? That is the one you want to use for crossing. (2) Which is the oldest species and where did it come from? This may give some clues about even earlier relatives in Southeast Asia. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

1506. Hyde, Tom. 1997. Health: Bean there, done what? Soy foods have long been favoured by vegetarians and other careful-what-you eat types as the healthy alternative to animal proteins but critics of the seemingly innocuous bean suggest its anything but. Tom Hyde looks at both sides of a long-running debate. *Metro (Auckland, New Zealand)*. April. p. 68-76.

• ***Summary:*** This is one of the most detailed and balanced articles on the "soy debate" seen to date. Dick James attended Canterbury University law school in Christchurch, New Zealand. There he met his wife Valerie. They ended up living and raising two kids in the San Francisco Bay Area [actually Walnut Creek]. He worked as a contracts manager for Bechtel, the multinational construction firm, while completing an MBA at Golden Gate University in his spare time. Valerie worked as a schoolteacher, and they also sold real estate. By the mid-1980s they had more than $2 million in savings; they decided to pursue their favorite hobby, raising exotic birds. They moved back to New Zealand and settled in Big Monroe Bay near the Whangarei Heads. In 1990, on 2½ acres of waterfront land, they established their own aviary and began raising colorful parrots, parakeets, and finches on seeds and berries. All went well for about a year until they began hand-feeding the birds a powdered mix containing more protein (about 20%) made by a California company named Roudybush. For the first six months, the Jameses' flock of about 600 birds seemed to thrive on the new diet. They produced offspring during the first breeding season and their plumage was good. "Then, over the next 12 months, the Jameses lost 542 chicks and 289 adult birds. Many of them haemorrhaged violently before death. Some simply faded away. The remaining birds produced 1,272 infertile eggs. Valerie says: 'I felt like the wrath of God had come down on us.'"

They began to do research and "identified soy protein in the bird feed as a possible explanation not only for the mysterious death of their birds, but for the hyperactivity and aggression of their own children who had been raised on soy formula."

Additional information reinforced their suspicions and they concluded, rightly or wrongly, that soy protein was a dangerous substance to feed both birds and babies.

They contacted their scientist brother-in-law, Dave Woodhams, and together they formed the "Soy Toxin Team" and began what became a huge worldwide debate (more like a war of words) over the safety of soy protein in animal feeds and infant formulas. The team admits that traditional Asian methods, some of which involve long fermentation processes, produce foods that are safe to eat, but that modern mass production methods do not.

Trevor Johnston of Bean Supreme, makes tofu, soymilk, and related products which he knows are safe–as do his many customers. But his business has been hurt by the Jameses' campaign. The more the Jameses talked with other animal breeders, the more their suspicions grew.

Mike Fitzpatrick, a young PhD in chemistry from Otago University, suggested to the Jameses that they pay him to go to the library to learn everything he could about toxins in soybeans. He quickly found many books and articles about natural toxins in soybeans–and other legumes too. Among these toxins were proteins and phytoestrogens, yet many of them were inactivated by heat or had such a low concentration that they were not generally a problem for humans–unless the dosage was too high and the exposure too long. Since he was looking only for negative information, his literature search was one-sided, unbalanced, and out of context. / Note: The above summary covers only the first few pages of this excellent article.

Photos show: (1) Dick and Valerie James. (2) Dave Woodhams. (3) Trevor Johnston of Bean Supreme. (4) Pat Carr of Roudybush; she was forced to close her business after much negative publicity. (5) Mike Fitzpatrick. (6) Dr. Ian Robertson, PhD in zoology and researcher of anti-cancer compounds at Auckland medical school. Address: Metro's Deputy editor.

1507. Monsanto Company. 1997. Annual report to shareholders–1996. St. Louis, Missouri. 64 p. 28 cm. • ***Summary:*** In 1996, Monsanto reported net income of $385 million (down 48% from 739 million in 1995) and earnings per share of $6.31 (down 2% from $6.46 in 1995). But pages 4-5 state: "Financially, 1996 was by far the best year in our history. Before giving effect to charges related to the spinoff of the chemical business and other actions in 1996 ($500 million aftertax, or $0.84 per share) and to a nonrecurring gain in 1995 ($11 million aftertax, or $0.02 per share), net income of $885 million exceeded our 1995 record by 22 percent, and record earnings per share of $1.48 were up 18 percent. Return on shareowners' equity (ROE) of 22.3 percent, excluding one-time charges, marked the third consecutive year in which we surpassed our historical 20 percent ROE benchmark."

In a "Letter to shareowners," Chairman and CEO Bob Shapiro begins: "In late 1996, your board of directors approved a plan to split Monsanto into two companies by spinning off our chemical businesses."

The theme of the report is "We're starting up again. In 1901, a 42-year-old high school dropout named John F. Queeny founded a new company to make saccharin on the shores of the Mississippi River in St. Louis, Missouri. He named it after his wife, Olga Monsanto Queny. More than 95 years later, his little company–built on faith, hope, and $5,000–is starting up again. Monsanto company is now spinning off its chemical businesses and forming a new life sciences company."

Roundup herbicide, introduced in 1974, has proved to be the agricultural growth product of the 1990s. In 1996, Monsanto sold more than 3 times as much of it as they did in 1990. "Sales of Roundup Ready soybeans were limited only by the availability of the seed" (p. 3).

Page 11A states: "Soybean growers who used Roundup Ultra herbicide on Roundup Ready soybeans reported extremely high satisfaction with the performance of the technology, and indicated they would more than double their Roundup Ready soybean acres in 1997. Our seed partners expect to have enough Roundup Ready soybean seed to plant between eight million and 10 million acres in the United States. Another 250,000 to 300,000 acres have been planted for the 1996-1997 growing season in Argentina." "Conservation tillage began as an environmental trend. Farmers could reduce soil erosion by reducing or eliminating tillage practices, often used as a way to control weeds. As more farmers adopted this technique, they also found they could reduce labor, energy and equipment costs. Roundup is the herbicide of choice for conservation tillage because it is effective and cost-efficient."

"Agricultural products outlook (p. 37): *Roundup* and other glyphosate-based herbicides face competition from generic producers in certain markets outside the United States. Patents protecting Roundup in various countries expired in 1991, while compound *per se* patent protection for the active ingredient in Roundup herbicide continues in the United States through the year 2000. Management expects the recent technological breakthroughs in manufacturing processes and formulation advancements, as well as rapidly expanding capacity to produce Roundup, to improve Monsanto's cost position and to help maintain its leadership position. New value-added formulations of Roundup, such as Roundup Ultra and Roundup Pro in the United States, and Roundup Bioforce and Roundup Geoforce in Europe and Australia, have been successfully introduced."

"Principal acquisitions and divestitures: In February 1997, the company acquired the Asgrow Agronomics seed business from Empresas La Moderna S.A. for $240 million. In January 1997, Monsanto announced that it had reached separate agreements to acquire Holden's Foundation Seeds, Inc., the world's leading foundation seed corn company, and Corn States Hybrid Service Inc. and Corn States International S.a.r.l., the exclusive worldwide marketing and sales representatives for Holden's products. The total costs of these acquisitions will be up to $1.02 billion. It is anticipated that one-time charges associated with acquired research will be recorded in conjunction with these acquisitions.

In March 1996, Monsanto acquired significant equity positions in Calgene, Inc. and DeKalb Genetics Corp. In November 1996, Monsanto acquired a controlling interest in Calgene. This gave Monsanto the right to nominate five of the nine authorized directors on Calgene's board. The combined investment in these plant-science businesses totaled approximately $340 million. In May 1996, Monsanto acquired the plant-science assets of Agracetus from W.R. Grace & Co. for approximately $150 million."

A 26-page report titled "Notice of annual meeting of stockholders, April 25, 1997" accompanies the annual report.

Note: By 6 Oct. 1997 Monsanto had spun off the chemicals portion of its business and named it Solutia, Inc. For every 5 shares of Monsanto stock owned by an investor, he or she was given one share of Solutia, which had an initial value of $20/share. Address: 800 North Lindbergh Blvd., St. Louis, Missouri 63167. Phone: (314) 694-5432.

1508. Johnston, Trevor. 1997. Recent nightmares at Bean Supreme Ltd. in New Zealand (Interview). *SoyaScan Notes.* May 7. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The last 18 months have been a marketing nightmare for Trevor. The problems started when toxicologist, who works for the government in New Zealand, fed his parrots a soy-based formula and they died. He blamed the soy. He and others formed "The Soy Toxin Team" and have been working ceaselessly to (1) get soy-based infant formula banned from the market in New Zealand, and (2) alert the public to what they feel are the dangers of the phytoestrogens in soybeans. Trevor has a huge file of anti-soy and anti-phytoestrogen articles published in New Zealand. Note that in the USA almost all of the many articles about the phytoestrogens in soybeans consider them to be one of the main benefits of soybeans.

The second major problem has been Roundup Ready soybeans–which are genetically engineered by Monsanto. Greenpeace in Australia has made these soybeans their major project; they are working to alert the public to the fact that most food products that contain soybeans–unless specifically labeled otherwise–probably contain at least a small percentage of Roundup Ready soybeans–which are not labeled as being genetically modified (GM). These soybeans offer no benefits to consumers and Greenpeace argues that they main contain some real dangers. They have conducted a number of media actions, such as taking soy products off supermarket shelves to point out that they contain soy–as the cameras roll. The result has been to give soy a negative image in Australia. A group called the Natural Food Commission (an offshoot of Maharishi's Transcendental Meditation or TM) has been formed and is now circulating a draft proposal on genetically modified organisms in foods–urging that they be labeled.

Trevor's sales have decreased by 25% over the past 18 months. His biggest specific problem is trying to find a source of soy protein isolates that are guaranteed to be free of GM soybeans. Protein Technologies International is refusing to deal with this issue by saying that their isolates are safe. There are other big users of soy protein isolates in Australia: A large sausage company and Sanitarium Foods. Of his various products, Trevor's isolate-based soymilk has suffered the greatest drop in sales. Sales of his tofu products have not decreased, and sales of his soy ice creams are down only a little. Address: Managing Director, Bean Supreme Ltd., P.O. Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: (09) 590 592.

1509. Johnston, Trevor. 1997. Genetically modified foods update–May 13 (News release). Auckland, New Zealand: Bean Supreme, Ltd. 1 p. May 13.
• ***Summary:*** "This memo is to let you know what we are doing to ensure our consumers GMO (genetically modified organism) free soy products.

"At present we **can** control the source of our soybeans which we import. We do not and will not in the future import any genetically modified whole soybeans for our Tofu manufacture.

"The situation is more complex with soy derivative products which we also use in many of our products, e.g. soy protein powders [soy protein isolates]. These are highly nutritious and valuable food ingredients to us. We along with many other companies are lobbying our suppliers to guarantee us GMO free product. At present they can't give us this assurance because they draw their source beans from commodity stocks of beans which may or may not contain small quantities of GMO beans (Roundup Ready beans comprise approx. 2% of the US crop in 1997).

"There is presently no requirement in U.S. law to segregate GMO and conventionally bred stocks."

Johnson ends the new release with a suggestion: "If you wish to express your views directly to the manufacturer of soy protein powders such as those used widely in the industry write to; Michael W. Sel, Director, Product Quality, Protein Technologies International, 900 Checkerboard Square, St. Louis, Missouri 63814 USA. Fax 001 314 982 1841." Address: Marketing director, Bean Supreme Ltd., Box 12082, Penrose, Auckland, New Zealand]. Phone: 64 9 579-0592.

1510. Conner, Tony; Hickford, Jon; Savage, Geoffrey. 1997. There's nothing to fear from the genetic engineering of our food: A baseless scare campaign has been mounted against genetic engineering of food. Dialogue. *New Zealand Herald.* May 14, p. A15.

Address: Lecturers at Lincoln Univ. in plant genetics, molecular biology and food biochemistry respectively.

1511. Hymowitz, Ted. 1997. Thoughts on genetic engineering and Roundup Ready soybeans (Interview). *SoyaScan Notes.* May 26. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Ted has just received a letter from Greg Gambrill of Sanitarium Foods in Australia asking how they should relate to consumers who do not want to consume genetically engineered (Roundup Ready) soybeans. Address: Prof. of Plant Genetics, Univ. of Illinois, Urbana, Illinois.

1512. Hatchard, Guy. 1997. If genetic engineering is safe, why don't they prove it? *New Zealand Herald.* June 3 or 8. Address: Director of the natural food commission in the Natural Law Party.

1513. Bean Supreme Ltd. 1997. Price list with sale. Auckland, New Zealand. 1 p. Single sided. 30 cm.
• ***Summary:*** Effective 20 June 1997. Black on yellow. The products are listed in categories except for the first, which is soyfoods. For each is given the product name, weight, price, barcode, outer, and price. Tofu bulk organic. Tofu firm vacuum pack. Tofu firm vacuum pack organic. Tofu soft Asian. Tempeh vacuum pack. Tempeh fr. frozen. Soysage. Luncheon [Traditional, Cajun, Smoke]. Tempeh pattie frozen. Meatfree sausage.

Soymilks: Soyplus 1 liter. LiteLicks [soy ice cream] (Honey Vanilla, Wildberry, Maple Walnut, Chocolate, Fruit Fiesta, Almond Fudge, Bulk packs) (9 or 16 liters).

Biofarm yoghurts (5 flavors). Malabar goat yoghurt. Olive Grove: Falafel mix, hoummus, Souvlaki sauce, tahini.

Koromiko cheese (11 types, of which the first 4 are vegetarian). Koromiko wax selection (private bin). Pacific Harvest: Agar, kelp and karengo granules, fronds, or flakes. Address: Box 12082, 140 Hugo Johnson Dr., Penrose, Auckland, New Zealand. Phone: 64 09 579 0592.

1514. Kikkoman Corporation. 1997. Annual report 1996. 339 Noda, Noda-shi, Chiba 278, Japan. 24 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1997. Contents: Financial highlights. Profile. A message from the president: The year in review, an emphasis on growth, principal management issues, looking ahead. Overseas operations–A world brand: The Americas, Europe, Asia and Oceania. Financial section. Corporate history. Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

During fiscal 1996, ended 31 December 1996, consolidated net sales worldwide rose 1.3% over the previous fiscal year to 206.0 billion yen, down from a peak of 211.7 billion yen in 1992. Net income surged 63.8% to a record 7.3 billion yen, up from 4.4 billion yen in 1995. In 1993 net income was 4.7 billion, in 1992 it was 4.9 billion, and in 1991 it was 6.2 billion–very volatile.

Overseas sales jumped 21.8% in 1996 to 54.4 billion yen, and accounted for 26.4% of consolidated net sales, up 4.4 percentage points from fiscal 1995. "Although the declining value of the yen helped boost overseas sales, this impressive result mainly reflects the excellent performance of the company's subsidiaries in the United States." In Japan, difficult conditions resulted in a 4.4% decrease in sales.

During the past year: Kikkoman increased efforts to boost sales of its premium-quality *Marudaizu* Soy Sauce (made from whole soybeans rather than defatted soybean meal). July 1996–Kikkoman starts construction of its first soy sauce manufacturing plant in Europe, located in the city of Hoogezand-Sappemeer, in the northern Netherlands. Aug. 1996–Relocated its Tokyo Head Office to Nishi-Shinbashi in central Tokyo, in a move to expand the role of this office–and introduced E-mail. Feb. 1997 began constructing its second U.S. soy sauce manufacturing plant in Folsom, California, on a 52-acre site; the ground-breaking ceremony took place in March 1997. Feb. 1997–Launched a new *Yakiniku no Tare* (Steak Dipping Sauce) in *Akadare* (Red Label) and *Kurodare* (Black Label) flavors.

"The Americas." Kikkoman's new plant in Folsom, California, is scheduled to come on stream in autumn 1998 with an initial production capacity of 10,000 kiloliters per year (about 2.64 million gallons per year). The plant will be operated by Kikkoman Foods, Inc., the company's wholly-owned Wisconsin-based subsidiary, and approximately 25 local employees will be hired. The plant will supply Kikkoman *Koikuchi Shoyu* (regular soy sauce) to customers in the western United States and Canada. Kikkoman's first shoyu plant outside Japan began operation in Wisconsin in 1973. Kikkoman has increased the production capacity of that plant 10-fold to meet expanding demand. [Note: Since the initial capacity was about 10,000 kiloliters/year, the current capacity must be about 100,000 kiloliters/year or 26.4 million gallons/year.] Over the years, Kikkoman has captured approximately 50% of the market for soy sauce and soy sauce-related seasonings in the USA. A bar chart shows the relative production volume growth at the Wisconsin plant. It has increased 2.4 fold since 1986. In addition to its plant in Wisconsin, Kikkoman has four subsidiaries in the USA: (1) Kikkoman International Inc. (San Francisco, California), which markets a broad range of Japanese and Asian foodstuffs, primarily soy sauce, teriyaki sauce, noodle sauce, and tempura sauce. (2) JFC International Inc. (San Francisco), North America's largest importer and distributor of Japanese and other Asian foodstuffs. (3) Japan Food (Hawaii), Inc., which wholesales soy sauce plus other Japanese and Asian foodstuffs in Hawaii. (4) Japan Food Canada Inc., which wholesales soy sauce plus other Japanese and Asian foodstuffs in Canada.

In Europe, Kikkoman's plant in the Netherlands is expected to start deliveries of soy sauce in Oct. 1997. It has an initial production capacity of approximately 4,000 kiloliters per year. "Kikkoman currently supplies the European market with soy sauce produced at its Singapore plant. When operations commence at the Dutch plant, this volume will be available to meet the burgeoning demand for soy sauce in Asia and Oceania."

In Asia and Oceania: Kikkoman has two production plants, in Singapore (est. 1983) and Tainan, Taiwan (President Kikkoman Inc., which makes a sweet soy sauce developed for local tastes; it was established in Feb. 1990 as a joint venture company). "Marketing activities in Asia are performed by Kikkoman Trading (S) Pte. Ltd. of Singapore, and JFC Hong Kong Limited, while in the competitive markets of Australia and New Zealand, Kikkoman Australia Pty. Limited is enhancing the Kikkoman name. The latest addition to Kikkoman's Asian marketing network is Shanghai Kikkoman Trading Co. Ltd., which was established in December 1995" [in China]. Address: Noda, Japan.

1515. **Product Name:** Tofu Dessert [Mango].
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia.
Date of Introduction: 1997. June.
Ingredients: Filtered water, organic soybean, mango, peach, honey, apple juice, pectin (extract of citrus peel), natural nigari (magnesium chloride).
Wt/Vol., Packaging, Price: 200 gm cup.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in June 1997. Green, yellow, red and orange on pale blue.

1516. **Product Name:** So Good (Soymilk Based on Soy Protein Isolates) [Fresh, or Aseptic].
Manufacturer's Name: SoyaWorld Inc.
Manufacturer's Address: 4074 Lozells Ave., Burnaby (suburb of Vancouver), BC, Canada. Phone: 604-420-3240.
Date of Introduction: 1997. June.
New Product–Documentation: Talk with Peter Joe of Sunrise. 1999. May 26. So Good is created under a licensing agreement with Sanitarium Foods in Australia. It was first test marketed in mid-1997 (with the name SoyaWorld Inc. on the package), then in Jan. 1998 the product was officially launched with a big TV advertising campaign. It is sold in both fresh and UHT packaging, but 90% of the sales come from the fresh product. It is targeted at mainstream Canadian consumers and sold mostly in supermarkets.

Note: This is the earliest record seen (Feb. 2010) concerning SoyaWorld, Inc.

1517. Gordon, Richard. 1997. Now bread is soy much more. *National Business Review (New Zealand).* July 4.
• ***Summary:*** About Bürgen Original Soy & Linseed Loaf. This bread, which contains soy grits and linseed–both rich sources of phytoestrogens–is "designed to protect women against hormone-related disorders, namely the symptoms of menopause."

The idea of adding soy and linseed to bread traces its origins to research done by Prof. Wahlqvist and his team in Melbourne, Australia. Wahlqvist is a member of the Australia and New Zealand Food Authority (ANZFA). Address: Sent by Mike Kirkpatrick of NZ 1998.

1518. Alexander, Miriyana. 1997. Soy bread makers told to tone down claims benefits. *Sunday Star-Times (Auckland, New Zealand).* July 6.
• ***Summary:*** "The Ministry of Health has told Allied Foods, maker of the Burgen soy and linseed bread, to withdraw promotional pamphlets which contain unsubstantiated claims that the bread can protect against some cancer, heart disease and hormone-related disorders."

1519. Ross, Frances. 1997. Soy baby formula safety debated. *Dominion (New Zealand).* July 15. [1 ref]
• ***Summary:*** "British research has led to calls for the Health Ministry to ban supermarket sales of soy formula for babies, but the ministry and the Plunket Society say there is still not enough information to know whether soy has a harmful effect.

"The debate about soy formula centres on substances called phytoestrogens or isoflavones, which mimic the female hormone oestrogen." Address: Sent by Mike Kirkpatrick of NZ 1998.

1520. Guy, Camille. 1997. What's killing the kakapo? The kakapo are one of the country's rarest birds and might remain that way... the official breeding programme uses suspect feeding practices. *New Zealand Herald.* Sept. 13. G1. Weekend
• ***Summary:*** One "department official, Brian Lloyd, said a prudent risk management strategy, would be to withdraw soy-based commercial foods, and certainly not to feed hand-reared chicks with them."

1521. *Dominion (New Zealand).* 1997. Concern at hormones in babies' soy milk. Sept. 18. [1 ref]
• ***Summary:*** Dr. Kenneth Setchell, an American researcher, said babies fed soy milk infant formulas are receiving large doses of plant hormones at biologically active levels. Babies

on soy formula received the hormones at six to 11 times the amount shown to affect the menstrual cycle of adult women. Address: Sent by Mike Kirkpatrick of NZ 1998.

1522. Johnston, Trevor. 1997. Re: Update on Bean Supreme and genetically modified foods. Letter to William Shurtleff at Soyfoods Center, Sept. 22. 3 p. Handwritten, with signature on letterhead (fax).

• ***Summary:*** "The anti soy people are still alive and seem to appear in print as soon as there is any significant promotion of soy–even when it means rehashing old new (see enclosed).

"The parrot man [Richard James of Whangarei, New Zealand] still sends me hate mail–without stamps so my secretary unwittingly has to pay for the stamp.

"On a personal note–I remain very passionate about soy and grateful for your continued mentorship in this regard–albeit from a distance. Kind regards..." Address: Marketing director, Bean Supreme Ltd., Box 12082, Penrose, Auckland, New Zealand]. Phone: 64 9 579-0592.

1523. Bean Supreme Ltd. 1997. Soy kids: Easy family recipes with children in mind (Brochure). Auckland, New Zealand. 6 panels each side. Front and back. Each panel 10 x 14 cm. Undated.

• ***Summary:*** On the cover, red on pink, is an illustration of 7 happy kinds before a large rayed sun. The first 2 panels are about the health benefits of soyfoods. Then come 6 pages of recipes and tips for using Bean Supreme's Soyplus soymilk, tofu, and Lite Licks frozen dessert (soy ice cream). The company also makes tempeh and Tofu Luncheon. The back panel lists the company's soy products, has a statement about the goodness of soybeans, and states: "Bean Supreme brings happiness." Address: Box 12082, Penrose, Auckland, New Zealand.

1524. Dalais, Fabien S. 1997. Soy and menopause. *Soy Connection (The) (Chesterfield, Missouri–United Soybean Board)* 5(4):1, 4. Fall. [12 ref]
Address: Doctoral Candidate, Dep. of Medicine, Monash Univ., and Dep. of Perinatal Medicine, Toyal Women's Hospital, Melbourne, Austrailia.

1525. **Product Name:** Organic Tofu.
Manufacturer's Name: Organic Choice.
Manufacturer's Address: Huonville, near Hobart, Tasmania. Phone: (004) 91 1663.
Date of Introduction: 1997. September.
Ingredients: Incl. organically grown soybeans.
New Product–Documentation: Letter from Trishala Shub. 1998. Jan. 8. She has been the sole producer of organic tofu in Tasmania for the last 6 years. "I will soon be joining forces with people from Organic Choice in the Hobart area and we hope to diversify, offering miso and tempeh as well as tofu and soy dairy products."

Talk with Trishala Shub. 1998. Jan. 18. Organic Choice is a business, but the people who work there want to start their own community. They also own a restaurant, and she thinks they have already made about 3 batches of tofu, which they have sold to their restaurant. The tofu factory is located in a former jam factory in Huonville, which is just south of Hobart; she has the address at home. They may move the factory onto a big farm in Molsworth (not far from Hobart) and try to set up a community–a sort of Findhorn of the southern hemisphere. She plans to buy one large building that used to be used for hops processing. She would like to convert it for dehydrating organic fruits and vegetables, the tofu factory, and possibly tempeh and miso production. She would also like to teach leadlining (making stained glass windows) and have a healing center. The buildings are quite large.

1526. Ingram, David; Sanders, K.; Kolybaba, M.; Lopez, D. 1997. Case-control study of phyto-oestrogens and breast cancer. *Lancet* 350(9083):990-94. Oct. 4. [34 ref]

• ***Summary:*** Results from this Australian case-control study, compiled in Oct. 1997, show that women (average age 54 years) who excreted higher amounts of urinary isoflavones (especially equol, a bacterial metabolite of daidzein, but also enterolactone) had significantly reduced risk of breast cancer. No information was given on dietary soy intake. But based on urinary isoflavone excretion, soy intake was probably less than the equivalent of 1 oz of tofu per day, even in women consuming the most soy.

The Introduction begins: "There is strong epidemiological evidence that diet has a role in the development of breast cancer. This evidence initially came from population and migration studies, the subsequent cohort and case-control studies in human beings, and from animal experiments. The bulk of this research is based on the hypothesis that a diet rich in fat predisposes a woman to breast cancer. The results of large cohort studies, however, do not support this hypothesis (Jones et al. 1987; Willett et al. 1987), and interest has moved to other dietary factors"–such as phyto-oestrogens. Address: Univ. Dep. of Surgery, Queen Elizabeth II Medical Centre, Perth, Western Australia.

1527. Kluis, Alan. 1997. El Niño suggests higher [soybean] prices. *Soybean Digest.* Oct. p. 42.

• ***Summary:*** Each year around Christmastime, a warm equatorial current flows southward along the coast of Peru. In the 19th century, Peruvian fishermen named the current "El Niño" in honor of the Christ child *(el niño* means "the child" in Spanish). Later (in about 1925), when scientists noted that in some years this warm current which flows along the western coast of South America is warmer or more intense than usual, they adopted the name for the more potent but erratic climatic / weather phenomenon that is accompanied by abnormal and sometimes violent weather worldwide. This huge change in ocean temperature often changes weather patterns worldwide. Problems such as floods and droughts are common during and after a year in which El Niño occurs.

During the last strong El Niño, world soybean and corn production decreased by 9%. There was also a large drop in the fish catch in the South American Pacific ocean because these fish seek cooler water by moving elsewhere or diving deeper. With less fishmeal, additional soybean meal will be required. This year many nations in Southeast Asia are now experiencing drought. If this continues, it may lead to a large drop in palm and coconut oil production in Malaysia, Indonesia, and the Philippines during the first half of 1998.

Graph 1, titled "Southern Oscillation Index" shows the difference in the sea-level barometric pressure between Tahiti in the mid-Pacific and Darwin, Australia–from 1977 to 1997. The last strong El Niño was in 1983; another strong one is predicted for 1997. Graph 2 shows world corn and soybean production, year by year during the same period.

Note: This warm current also prevents upwelling of nutrient-rich cold deep water causing a decline in the regional fish population. Address: President, NorthStar Commodity Co.

1528. Sanitarium Health Food Co. 1997. So Good now: The fresh taste of today (Booklet). 146 Fox Valley Rd., Wahroonga, NSW 2076, Australia. 8 p. April. 15 cm.
• ***Summary:*** The first 2 pages of this attractive full-color booklet contain information about these soymilk products: Soy & linseed–a recipe for good health. What's so good about So Good. Rich in phytoestrogens. The Omega 3 benefit. Calcium. Vitamin B-12. Low fat. There follow 7 pages of recipes. Address: Wahroonga, NSW, Australia.

1529. Brady-Robeau, C.B.; Sutardi, -; Ismoyowati, D.; Fairbrother, A.H.; Boughton, T.J.; Petterson, D.S. 1997. Acceptability of lupin-based (Abstract). In: Sudarmadji, Suparmo and Raharjo, eds. 1997. Reinventing the Hidden Miracle of Tempe: Proceedings, International Tempe Symposium, July 13-15 1997, Bali, Indonesia. Jakarta, Indonesia: Indonesian Tempe Foundation. xi + 280 p. See p. 261-62. 26 cm.
Address: Curtin Univ. of Technology Perth Western Australia (e-mail cbrobeau@health.curtin.edu.au). Phone: 6189-351-2771.

1530. Petterson, D.S.; Fairbrother, A.H.; Brady-Robeau, C.B.; Sutardi, -; Boughton, T.J. 1997. Lupin as an alternative substrate for tempe manufacture (Abstract). In: Sudarmadji, Suparmo and Raharjo, eds. 1997. Reinventing the Hidden Miracle of Tempe: Proceedings, International Tempe Symposium, July 13-15 1997, Bali, Indonesia. Jakarta, Indonesia: Indonesian Tempe Foundation. xi + 280 p. See p. 260. 26 cm.
Address: 1. Agriculture Western Australia Locked Bag Bentley Mail Centre, WA 6983, Australia (dpetterson@agric.was.gov.au). Phone: 6189-368-3365.

1531. Soy Information Services. 1997. Adverse reaction to soy (Ad). *Daily Post (Rotorua, New Zealand).* Nov.
• ***Summary:*** This notice appears in the "Public Notice" section of the Classified Ads section. "The Swedish National Food Administration Livamedals Verket, has advised that life threatening reactions have been caused by soya, especially for children with asthma and peanut allergy. They have, in the last few years, recorded fatal allergic reactions to soy protein (3), peanut protein (1), hazelnut (1), milk (1). They advise that those with a severe allergy to peanuts should avoid soy protein intake and advise that reports from literature recommend that those infants who experience milk allergy from substituted breast milk formulas, should be given casein or whey hydrolysed products instead of soy formulas."

Note: Rotorua is a city near the center of New Zealand's North Island. Address: P.O. Box 3285, Onerahi, Whangarei [New Zealand]. Phone: Fax: (09) 434-0567.

1532. Nestel, Paul J.; Yamashita, T.; Sasahara, T.; Pomeroy, S.; Dart, A.; Komesaroff, P.; Owen, A.; Abbey, M. 1997. Soy isoflavones improve systemic arterial compliance but not plasma lipids in menopausal and perimenopausal women. *Arteriosclerosis, Thrombosis, and Vascular Biology* 17(12):3392-97. Dec. [28 ref]
• ***Summary:*** Must soy protein accompany soy isoflavones for the isoflavones to be effective in lowering the risk of coronary disease? A placebo-controlled crossover trial was tested in 21 women, who were given 80 mg/day of soy isoflavones (incl. 45 mg genistein) for 5-10 weeks. Systemic arterial compliance (arterial elasticity), which typically declines with age, improved 26% compared with the placebo. Arterial pressure, plasma lipids, and LDL oxidizability were unaffected. Thus, arterial elasticity, one important measure of arterial health, was significantly improved when these women took soy isoflavones to about the same extent as is achieved in conventional hormone replacement therapy. But effect was found with soy isoflavones alone on three other key measures of arterial health. Address: Baker Medical Research Inst., Commercial Road, Prahran, Melbourne, VIC 3181 Australia.

1533. Barton, Nicholas John. 1997. Edamame (vegetable soybean): the potential for a new Victorian industry. Bairnsdale, Victoria, Australia: East Gippsland Catchment and Agricultural Services; Victoria: Dep. of Natural

Resources & Environment. 45 p. 30 cm. Series: Asian Vegetables. *

• ***Summary:*** These soybeans could be marketed in Japan. Bairnsdale is in southern Australia, near the seacoast, about 150 miles east of Melbourne.

1534. Food and Agricultural Organization of the United Nations. 1997. Soybeans: Area harvested, yield, and production. *FAO Yearbook–Production (Rome, Italy)* 51:102-03.

• ***Summary:*** The 1997 Production Yearbook, under "Soybeans" (p. 102-03, in English, French, and Spanish) gives area harvested (1,000 ha), yield (kg/ha), and production (1,000 MT), each for the years 1989-91, 1995, 1996, 1997, for the following places: World. Africa: Benin, Burkina Faso, Burundi, Congo–Democratic Republic, Cote d'Ivoire, Egypt, Ethiopia PDR, Ethiopia, Gabon, Liberia, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

North and Central America: Canada, El Salvador, Guatemala, Honduras, Nicaragua, USA.

South America: Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Uruguay, Venezuela.

Asia (fmr = former). Asia: Azerbaijan, Bhutan, Cambodia, China, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea–Democratic People's Republic of (north), Korea–Republic of (south), Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Syria, Thailand, Turkey, Viet Nam (Vietnam).

Europe (former). Europe. Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czechoslovakia, Czech Republic, France, Germany, Greece, Hungary, Italy, Latvia, Moldova Republic, Romania, Russian Federation, Slovakia, Spain, Switzerland, Ukraine, Yugoslav SFR, Yugoslavia.

Oceania. Australia.

USSR.

1535. Hicks, P.A. 1997. Soybean industry applications in Asia. In: Napompeth, Banot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 437-40. Held at Chiang Mai, Thailand, 21-27 Feb. 1994.

• ***Summary:*** RAPA stands for "Regional Office for Asia and the Pacific."

Table 2 (p. 438) shows the area of soybeans harvested (in 1,000 ha) in 27 developing and 3 developed Asian countries, in the following years: 1982, 1989, 1990, 1991, and 1991. The last columns shows the average annual growth rate in soybean area from 1982 to 1992. The countries, their 1992 area, and their growth rates are (NL = no values listed; F = FAO estimate):

Developing countries (Bangladesh NL. Bhutan 2.0F, -5.4%. Cambodia, 8.8, 20.1%. China 7,203.5, -0.8%. Cook Islands NL. North Korea 310.07, 0.5%. Fiji NL. India 2,500.0, 12.8%. Indonesia 1,667.0, 9.4%. Iran 60.0F, 1.5%. Laos 6.1, 1.5%. Malaysia NL. Maldives NL. Mongolia NL. Myanmar 34.8, 2.7%. Nepal 22.0F, 9.4%. Pakistan 1.4F, -11.4%. Papua New Guinea NL. Philippines 10.0F, -1.7%. Rep. of Korea 120.0, 3.9%. Samoa, Western NL. Solomon Islands NL. Sri Lanka 1.4, -20.8%. Thailand 380.0, 14.4%. Tonga NL. Vanuatu NL. Vietnam 113.0F, 1.5%. Sub-total 12,440.0, 2.2%).

Developed countries (Australia 30.0, -2.2%. Japan 141.0, 0.3%. New Zealand NL. Sub-total 171.0, -0.2%).

Asia-Pacific Total 12,611.0, 2.2%.

Rest of world 41,979.7, 0.6%.

World 54590.7, 0.9%. Address: FAO Regional Agricultural Engineering and Agro-Industries Officer, FAO. RAPA, Bangkok, Thailand.

1536. Nguyen, Vong. 1997. Development of green soybean vegetable for the domestic and Japanese markets. Gordon, NSW, Australia: Horticultural Research & Development Corporation. 122 p. 30 cm. Series: Final report / Horticultural Research & Development Corporation (HRDC), No. VG130. *

Address: New South Wales, Australia.

1537. Nutrition Education Service, Sanitarium Health Food Company. 1997. Sensational soy cookbook. Sydney, London, Vancouver, New York: Murdock Books. 64 p. Illust. Index. 20 cm. [32 ref]

• ***Summary:*** A saddle-stitched vegetarian cookbook on glossy paper loaded with color photos and lightweight text. The author and nutritionist is Cathy McDonald of Sanitarium. Recipes developed by Wendy van der Veer of Sanitarium. Contents: The story of soy. The soy family: Miso, soy beans, soy breads & cereals, soy cheese, soy drink, soy flour, soy grits & soy flakes, soy 'meats,' soy pasta, soy sauce, soy snacks, tempeh, TVP, tofu, tofu desserts (ice cream and yoghurt). Breakfasts. Soy for health (isoflavones, menopause, breast cancer, osteoporosis, prostate cancer, heart disease). Light meals. The secrets of soy. Main meals. Soy in perspective. Desserts. Sensational soy (sample menus). Snacks. Know your nutrients. Bibliography. Estimated isoflavones in soy foods (table). Address: 1 Sanitarium Drive, Berkeley Vale, NSW 2261, Australia.

1538. Shanmugasundaram, S.; Tsou, S.C.S.; Hong, T.L. 1997. Potential role of Brazilian germplasm in Southeast Asia. In: Napompeth, Banot, ed. 1997. World Soybean Research Conference V: Proceedings. Soybean Feeds the World. Bangkok, Thailand: Kasetsart University Press. xxiv + 581 p. See p. 533-37. Held at Chiang Mai, Thailand, 21-27 Feb. 1994. [10 ref]

• ***Summary:*** CSIRO stands for "Commonwealth Scientific and Industrial Research Organization." Address: 1. CSIRO, St. Lucia, Australia; 2. Dep. of Agriculture, Bangkok, Thailand; 3. Khon Kaen Univ., Khon Kaen, Thailand; 4. Kasetsart Univ., Bangkok, Thailand; 5. CNPSo [National Center for Soybean Research, EMBRAPA], Londrina, Brazil.

1539. Solomon, Charmaine. 1997. Orient express book. Melbourne, Australia: Hamlyn. 92 p. *

1540. Messina, Mark J. 1998. Soy phytoestrogen pills–The biggest soy-related story of the year (Interview). *SoyaScan Notes*. Jan. 22. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Phytoestrogens extracted from soybeans, made by ADM and sold in pill form, went on the market in the USA in about November 1997. The first company to sell them was the Life Extension Institute in Wilton Manors, Florida. They call the product Mega Soy Extract; in their catalog it is listed under the category Soy Supplements. They sell the capsules in two sizes: 135 mg and 700 mg. ADM is not mentioned in the catalog, but they have their own ADM brand name for the product: Novasoy. Two research scientists to talk to at ADM are Eric Gugger (phone 1-800-637-5850 X-4380) and Rasik Daftary. Mark has the highest regard for these two men as scientists. They are dedicated to the facts as shown by scientific research.

Central Soya is now also making and selling the same kind of soy phytoestrogen pills, but ADM's were on the market first. What would happen if a person (such as a teenage girl wanting larger breasts) took 60 of these 135 mg pills at once? Mark has no idea; you'd have to know more about the absorption and blood levels. Many studies now suggest that a person needs to consume 70 to 100 mg/day of these soy isoflavones (equivalent to about 2 servings of tofu or 2 cups of soymilk) to derive the benefits. This is clearly much more than most Americans would be willing to consume day after day. So the supplements make it much easier for people to get their isoflavones. The average intake of these isoflavones among people in Asia is actually quite low, probably about 15-25 mg/day; this is much lower than was formerly thought to be the case, yet epidemiologic studies suggest that even these low levels confer benefits.

Solid studies increasingly show that these isoflavones give benefits in the areas of bone health (osteoporosis), reduced risk of heart disease, and reduction of menopausal symptoms. The benefits appear to be dose related–though there may be a threshold. There seem to be more benefits to women than to men, and little or no danger of any harm if taken at the recommended doses. Though the results are not yet definitive, there may be reduced prostate cancer risk for men. Some studies have also looked at the individual isoflavones. So Mark believes that many Americans will want to try these pills. They may take their place on the dining room table next to vitamins, minerals, and other supplements.

The area of greatest controversy concerns the effect of these isoflavones on breast cancer. Mark thinks it is very unlikely that they would increase the risk of breast cancer–even though some studies do seem to indicate that, and therefore further research is needed. Many difficult ethical questions are raised by how information in this area is presented to consumers.

Concerning soy and bone health, a 2-year study of monkeys without ovaries found that soy did not favorably affect bone health, even though estrogen did. That was one of the best studies conducted to date, yet it is never mentioned at any of the soy meetings. Mark is very concerned that there is a real bias in the way this information is being presented. This is such a "hot" area right now. There are so many fortunes to be made, so many researchers with patents, and so many trying to establish their careers on the basis of soy right now. Clinics all over the USA are now doing studies with isoflavones and with soy. Discussion groups on soy and breast cancer are taking place. "This is as hot as it gets."

A big-name researcher in this field, with a reputation in nutrition research going back 20 years, recently proposed the "soy protein hypothesis" in a scientific paper. It had to do with the possibly favorable effects of protein on kidney function, with no acknowledgment of previous research in this area. But this idea/hypothesis was out 4-6 years ago, and a summary in *The Simple Soybean and Your Health* (published April 1994) concluded that soy protein favorably affected kidney function. This appears to be but one of many examples where researchers are trying to establish their niche in soy and ride it to fame–and sometimes fortune. Now in nearly every major university in America, there is at least one researcher who is seriously interested in soy. That is really good for the field, and will help its progress.

The biggest event of 1997 is ADM starting to make soy isoflavone pills and thus taking soy isoflavones to the next level. These isoflavone pills are even sold on TV, in home shopping clubs–an amazing development. Many new books are being written on this subject by well-known authors, and soy plays a leading role. "There is a soy bandwagon here and everyone is jumping on it. The pills will take soy to the next level because there is more money to be made, and they are accessible to everyone. Now anyone can get the benefits (whatever they may turn out to be) without having to eat tofu or drink soymilk. Even with a bland soy powder, it was difficult for most people to consume enough of it (60 gm/day) to get benefits. Now that the soy isoflavones are available as pills, many researchers will now do clinical studies with them. Even now, there are studies underway all over the country. Three years ago, few people were aware of soy isoflavones. Now the research is almost one step removed from mainstream medicine. Virtually all researches involved with progressive health and nutrition, or with women's health, known about soy and phytoestrogens. It's just incredible. Being able to give out two placebo pills and two 'soy pills' a day makes it much easier to conduct controlled studies." People used to think of soy as strongly connected with tofu. Then they began to think of the isoflavones separately and independently. Isoflavones are a type of phytoestrogens, but when the word "phytoestrogens" began to replace the word "isoflavones" a quantum leap took place. Every physician knows what estrogens are, and the word has a power that resonates. For example, Mark recently gave a talk last year at a meeting of the American Dietetic Association (ADA). He titled it: "Soybean phytoestrogens: Possible alternatives to hormone replacement therapy."

So, in the field of soy, ADM and their soy pills is the big story of late 1997 and early 1998. ADM is a huge, respected company, and they plan strong promotion for these soy pills. Granted there were soy isoflavone pills available last year, but because they were made from the ground sprouts (hypocotyls) of soybeans, they had very low levels of genistein and they weren't nearly as potent as ADM's pills. Moreover, ADM is learning ways of processing soybeans to further concentrate the isoflavones, which will make the pills even more potent. Mark believes that the "halo effect" of these soy pills will soon benefit the whole category of soyfoods as well.

Mark has no plans to take these pills; he gets plenty of isoflavones from his natural diet, which contains lots of soymilk, plus some tofu, and other soyfoods.

An Australian newspaper reported that Protein Technologies International (PTI) recently paid $15-20 million to Novagen, an Australian pharmaceutical company that will be marketing Promensil (made of isoflavones from red clover). Note: As of 3 Feb. 1998 Novagen is not listed in the text of any article in the *Wall Street Journal* since March 1984. It is not clear to Mark exactly what PTI got for this large amount of money (perhaps patent right to claims about a product containing isoflavones). This last weekend, PTI helped to sponsor a symposium at UCLA, attended by only about 45 people, but with good press coverage that made the wire services. The point is, a lot of money is being spent on this subject. Whereas ADM does not live or die by its new isoflavone business, some smaller companies do.

The proceedings of the Brussels symposium have been in the hands of editors at the *American Journal of Clinical Nutrition* since Sept. 1997; they have been reviewed, the comments have gone out, but they will not be published before Sept. 1998. Address: PhD, 1543 Lincoln St., Port Townsend, Washington 98368. Phone: 360-379-9544.

1541. Quick, Graeme R. 1998. The early history of the combine in the United States (Interview). *SoyaScan Notes.* Feb. 23-24. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Graeme, an Australian who got PhD at Iowa State University, is an expert on this history of the combine and the co-author (with Wesley Buchele) of the classic book on that subject, *The Grain Harvesters*. He is now working on a new edition of that book, and welcomes the suggestion to include a glossary of basic terms (such as cutterbar, floating cutterbar, reel, pickup reel, header, etc.) for the non-professional reader. Graeme's PhD thesis was about improvements in the combine for soybean harvesting. The combine (and the word "combine") existed as early as 1883. Graeme is a Seventh-day Adventist and has been a vegetarian for 40 years. Wes Buchele is now retired and living in Baja California, Mexico; he often returns to Iowa during the summer.

The Grain Harvesters includes a long and very original chapter on the history of combines in soybean production titled "Cinderella Soybean" (p. 235-32). One especially interesting part of this chapter is the story of the invention and development of the floating cutterbar by Joe Zeb, Horace D. Hume, and J. Edward Love. In 1976 Graeme conducted in-depth interviews with Hume and with John E. Love, the son of J. Edward Love, who now runs the family combine business in Garfield. These interviews form the basis of the story of the floating cutterbar. A floating cutterbar "floats" in two directions to cut as low as possible on changing terrain. The blade is flexible from left to right, like a long cross-cut saw. Moreover, the header itself is mounted on shoes that run along the ground and allow it to move up and down. Graeme also invented the Kwik-Cut Head which was released in 1977 and improved the performance of the cutterbar.

The coulter is an ancient piece of farm equipment, which goes back to the days of the horse-drawn plow, perhaps as early as the 1820s. It is a blade (initially a knife, now a disc) that runs in front of the plow, and makes a shallow cut into the soil to help the plow. Note: According to the *Oxford English Dictionary,* the word coulter (spelled *cultre* at the time), was first used in about 1000 A.D. by Aelfric, an abbot and writer in England (in the work *Colloq.).* It is defined as "The iron blade fixed in front of the share in a plow; it makes a vertical cut in the soil which is then sliced horizontally by the share."

Graeme has not done much research on the early history of the soybean in Australia. The man to contact on that subject would be Don Byth, who is known as "Mr. Soybean" in Australia. He is probably still active at the Dep. of Agriculture, Univ. of Queensland, St. Lucia, Queensland, Australia.

Graeme had not realized that the tractor first began to be used in soybeans at almost exactly the same time as the combine. He thinks that is a very profound observation. Tractors existed in the late 1800s, but why weren't they used in soybeans until about 1923? Graeme can think of at least three reasons: First, in the early 1920s, soybeans were generally grown in small fields / tracts–probably too small to make efficient use of a tractor. Second, soybeans were grown mostly for forage and hay at that time, and fed to livestock. Farmers who did this would be more likely to get their draft power from horses. Third, the early combines were very large, and mostly of the pull type, which required a large tractor, that would not fit well on a small soybean farm. The horse was the dominant source of draft power until about 1919, the year of the peak number of horses on U.S. farms. By this time, the number of tractors was increasing rapidly, and it continued to do so until the Great Depression, when they took a savage blow. Only after the Depression, with the start of World War II, did they start to rise again.

The combine was one of the reasons that soybeans switched from being a hay crop to a seed crop. Not until 1941 did acreage of soybeans planted for seed pass that planted for forage and hay. Address: Dep. of Agricultural Engineering, Davidson Hall, Iowa State Univ., Ames, IA 50011-3080. Phone: 515-294-1320.

1542. Liener, Irvin E. 1998. Re: Soy infant formulas. Letter to Valerie A. James, RD4, Whangarei, New Zealand, March 11. 1 p. Typed, with signature on letterhead. [4 ref]
• ***Summary:*** "As editor of the journal in which this article appeared, I would be pleased to publish your letter because I think, as you do, that it is high time that someone presented both sides of the story about soy infant milk formulas." Address: Editor, Journal of Agricultural and Food Chemistry, Dep. of Biochemistry, Univ. of Minnesota, 1479 Gortner Ave., St. Paul, Minnesota 55108.

1543. James, Richard F.; James, V.A. 1998. Re: Oppose petition by ADM for soy isoflavones to be generally recognised as safe (GRAS). Letter to Dr. Alan M. Rulis, Ph.D., Director, Office of Premarket Approval (HFS-200), Center for Food Safety and Applied Nutrition, Food and Drug Administration, 200 C St. SW, Washington, DC 20204, March 25. 2 p. Handwritten, with signature. [10 ref]
• ***Summary:*** "The thrust of our submission will be the biological effects demonstrated in the following published papers:" Ten scientific studies are cited. Address: R.D.4, Whangarei, New Zealand.

1544. Irvine, Clifford H.G.; Fitzpatrick, M.G.; Alexander, S.L. 1998. Phytoestrogens in soy-based infant foods: Concentrations, daily intake, and possible biological effects. *Proceedings of the Society for Experimental Biology and Medicine [PSEBM]* 217(3):247-253. March. [64 ref]
• ***Summary:*** Note: This paper was presented in Dec. 1995; it was published as a separate booklet on 5 March 1995 by the Soy Information Network (SIN; Whangarei, New Zealand). Address: 1&3. Animal and Veterinary Sciences Group, Lincoln Univ.; 2. Chemistry Dep., Univ. of Auckland, Auckland. All: New Zealand.

1545. Marutani, Mari; Schlub, Robert. 1998. Vegetable soybeans on Guam. *Cooperative Extension, College of Agriculture and Life Sciences, University of Guam.* March. 6 p.
• ***Summary:*** Contents: Vegetable soybean plant: What is a vegetable soybean, which part is edible, nutritional value, how to grow vegetable soybeans, how to market. Suggested cultural practices: Choice of land, planting date, land preparation, seed selection, root inoculant, fertilizers, planting methods, irrigation, diseases and pests, harvest, storage of harvested plants before shipping, processing, saving seeds and seed storage, soybean plant in crop rotation.

Market survey: Objectives, findings. Survey conducted to restaurant and bar owners in June, 1997. There were 41 responses. 73% of the people surveyed said they were familiar with "Edamame." 34% of the restaurants and bars offer "Edamame" on their menu. 90% of those who offer "Edamame" on their menu said they would buy locally grown fresh vegetable soybeans. Address: 1. PhD. Horticulturist, Agric. Exp. Station; 2. PhD, Plant Pathologist, Guam Cooperative Extension. Both: College of Agriculture and Life Sciences.

1546. James, Richard F. 1998. Work to expose the dangers of toxic substances in soybeans (Interview). *SoyaScan Notes.* April 18. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Richard James, who was born and raised in New Zealand and still speaks with a "down under" accent, lives with his wife Valerie and many exotic birds in Whangarei, a fairly large city near the northern tip of New Zealand's North Island, about 80 miles north of Auckland. Before he moved to New Zealand, he was a lawyer and real estate agent in the San Francisco Bay area.

After many of Richard and Valerie's parrots began to die, Richard started to notice that a number of different animal species, including humans, were having some adverse reactions to the consumption of soy products. First he spent a considerable amount of his own money phoning around New Zealand, starting with agricultural people who were having trouble with their birds. It turned out, bit by bit, that rabbits, guinea pigs, pet hamsters, race horses–indeed everything being fed soy products was having some really nasty problems. And yet we couldn't quite put our finger on exactly what it was. We noticed that it was also affecting the reproductive capacity; we were getting deformed babies and infertile eggs. Valerie, apart from being distraught at watching all her lovely friends dying in miserable ways, spent a lot of time talking to Rob Shaw, the technical manager of a health food company–whose phone number Richard would be glad to share. Because the end results are so diverse, because these bloody soybeans have so many levels of toxicity, you almost couldn't put your finger on what was happening. Ultimately Valerie mentioned to Rob that the bird food was being advertised as producing 11-week-old baby birds that had the sexual characteristics of 2-year-old birds. At this point Richard and Valerie had no idea what an estrogen was, but Rob had enough biochemistry (and he really is quite a brilliant fellow) that he said immediately: Oh! That's premature maturation. Not many people in this part of the world would have known about that. Other good men are Dan Sheehan (of the USA) and Glen Plymate (616 Westland Dr., Alameda, CA; a personal friend of Richard's to whom Richard has sent many documents implicating the toxicity of soy).

Sheehan's revenge: Two important scientific papers have been published. The most recent was published in Nov. 1997 in *Biochemical Pharmacology*. The significance of these two is that they did basically what Richard suggested to Sheehan and his co-workers. They examined the huge number of thyroid cases that are reported in the medical literature. Note that one of the first places the effects of the estrogenic chemicals (like DDT, the dioxins, cadmium, mercury, etc.) shows up is in the thyroid gland. Having discovered that, see if you can prove the link between that and soy. The soy industry's defense has always been that their processing gets all the toxins out; that's why nobody else ever complained. In response to that, we have produced all these published research papers about prostate tumors in dogs, and liver cancer and infertility in cheetahs, mice, rats, hamsters, etc. Richard and his research team has the best library of this type of research in the world. Richard offers to send Shurtleff copies of page 1 and the bibliography of many of these key papers.

Back to Sheehan's revenge: They set out to prove that flavonoid compounds cause thyroid cancer. Again, there were two key papers.

There has been a major cover-up. When Rob Shaw look at the early literature Richard and his team were collecting on their literature review, he was very upset: He said the U.S. government must have known (for at least 20 years) the estrogenic content of soy infant formulas, and that that in some cases little girls fed soy infant formula show premature breast development, premature menstruation, premature menopause (at about age 22), etc. It doesn't show up until the kids reach puberty. Then (according to the dosage) the thyroid deficiency and the problems mentioned above start up; the evidence is unequivocal.

Another thing that has never been revealed properly or has been propagandized, like the premature thelarche in Puerto Rico: The only food correlation they found was with soy infant formula. The Centers for Disease Control (CDC) went off and did another search and absolutely, completely ignored soy infant formula, the foods fed after infant formula, and they ignored boys–so they came up with the answer that there is no incidence of anything–no problems. Basically, they defined the scope of their study no narrowly, that they defined away the problem. But even in this limited definition of girls who had problems, they were 2¼ times as likely to have been fed soy formula as anything else.

The other two emidemiologies were on Long Island, New York, where the North Shore Community Hospital went looking for a reason for the high incidence of auto-immune thyroid disease in children age 10 plus or minus 4 years. This occurs when the immune system has gone berserk and is actually attacking the thyroid gland. This is a permanent debilitating disease; its manageable, but chances of early death are fairly high. Kids with that syndrome were 2½ times as likely to have been fed soy formula. The same North Shore Community Hospital also found that kids with insulin-dependant diabetes–which is another auto-immune disease–were twice as likely to have been raised on soy formula. Moreover, some kids with this type of diabetes also had the auto-immune thyroid disease–and no one looked at abnormal breast development in these two groups of kids.

ADM stated to the FDA that they had determined that the soy isoflavones they are now selling [Novasoy pill with 70 mg of soy isoflavones in a softgel form] were safe to be used as a general additive to all foodstuffs. This is "totally toxic."

In 1966 the National Academy of Sciences, National Research Council, Food and Nutrition Board, Food Protection Committee, compiled a very important book titled *Toxicants Occurring Naturally in Foods* (Washington, DC: NRC Press, 301 p.). A greatly expanded 2nd edition was published in 1973 (vii + 624 p.). Their basic approach was: Gee whiz, isn't it great that we have these analytical methods so that we can detect when these toxicants are getting into our foodstuffs. They concluded that the main source of estrogens in foodstuffs is the isoflavones in soy products. Hormone replacement therapy isn't necessarily the same as the chemicals that are in soy; they both mimic hormones but they may not have the same biochemical effects.

"I could go on weeks talking like this but I'll tell you the basics that we can document... We were absolutely 'monstered' by some of the biggest and nastiest companies in the world. But also by certain arms of the U.S. government, particularly the U.S. Department of Agriculture." A professional journalist is now writing a book about this. The small things were late night phone calls. But the pitch that was made all over New Zealand was: "We can buy TV channels. We can divert medical schools. We can influence governments. And we have millions of dollars and teams of lawyers–and we crush nutters like you. You won't last six months. We will destroy your credibility. We do this to 20 or 30 like you every year. I am not a retired bird raiser. My professional training was as a lawyer. I practiced in New Zealand, in London, and in San Francisco–all quite successfully–until the California Bar Association lowered the boom on lawyers who hadn't passed the California Bar. I had an office at Bechtel Corporation in the legal department on the 20th floor, the corner office, facing out towards the Ferry Building. He also got an MBA at Golden Gate University in San Francisco (part time; it took about 5-7 years). "Right now I am the soy industry's biggest friggin' pain in the ass." After I quit Bechtel, we were in the real estate business in Walnut Creek, directly east of San Francisco. We hit the boom in 1976, invested quite carefully in California real estate, and made a few million dollars. Returned to New Zealand and decided to do what the liked–raising exotic birds. His wife has dual citizenship (U.S. and New Zealand).

Dr. Clifford Irvine was (Richard believes) the "chairman of the governing board of Lincoln University in Canterbury, New Zealand. He was also dean of the Dep. of Animal Sciences. His secretary intercepted so many terrifying phone calls–death threats and whatever–that she finally left and went home. She broke down. Cliff was told that if he went to the USA to Dan Sheehan's conference, he should wear body armor and travel on a separate plane from Mike Fitzpatrick–which he did. Mike also was told to wear body armor and to watch out. This was not very nice stuff. Mike's employer was driven out of his mind. I've got it documented from Bill Grayson, who owned Grayson Laboratories, that the pressure was coming from Bean Supreme and Nestlé. If you phone somebody three times a bloody day and tell him the whole New Zealand Food Industry is going to take their business away from his laboratory, you'll frighten the sh*t out him.

"The soy boys pick a pinch hitter in some country. They started with Bean Supreme, then dumped him, and they've been using a fairly big Seventh-day Adventist owned health company–the most corrupt, dishonest company in the world–and I can document that for sure." They have been putting incredible pressure on Richard and the others in his group. Continued. Address: 1868 Whangarei Heads Road, Rural Delivery 4, Whangarei. Phone: +64 9 434 0564.

1547. James, Richard F. 1998. Work to expose the dangers of toxic substances in soybeans. Part II (Interview). *SoyaScan Notes.* April 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued. Originally the scientists looked at this soy matter; Richard was not a scientist, he was a check writer, because he and his wife saw something wrong that demanded a scientific explanation. Richard didn't even hire the scientists; they were commissioned originally by the health food company. Rob Shaw, the technical manager who had experience in the pharmaceutical industry, talked to everybody he knew to find out who was the best analytical chemist in New Zealand. They picked Allan Aspell, who owned his own consulting firm. First, Rob Shaw commissioned them to analyze the literature. When that was done, Rob told Richard that he was already convinced there was a problem with soy. Richard replied that he needed a toxicity report on the quantities toxins found in soy. So from the literature they had discovered, they analyzed for genistein, daidzein, etc. including from infant formulas. The soy industry has tried to make it appear–all over the Internet, etc.–that this was just one crazy bird breeder who fed raw soy flour to his birds. It wasn't! It was a crazy bird breeder who had fed soy infant formula to his children in 1969 and 1970. It was Isomil and the James' family was living in Walnut Creek at the time. Looking back, they saw some of the same effects in the early infancy of their children that they saw in the birds 20 years later. One of the really characteristic ones is a high level of hyperactivity. The estrogens wind the brain cells and central nervous system up. We had to move out of the 20th floor of the Golden Gateway Apartments in San Francisco, California, break the lease, which cost a pretty penny, because our son was so hyperactive we were afraid he was going to get out of the apartment and parachute 200 feet to the ground without a parachute. You notice it at about age 6-7 when they look like they are autistic or have attention deficit disorder. Those are subtle things; yet Richard could make a list of about nine things that he saw in the birds that he had seen in the kids. In early 1995 he made such a list and gave it to Dan Shehan and Kevin Medlock. After the short term problems you begin to see the serious deficiencies that reproductive systems and immune systems as they are supposed to be developing properly in later childhood. They have some "awful" anecdotal evidence of kids that were on soy formula for 20-21 months.

Richard will send Shurtleff the first page of about 20 of the most important documents.

In April 1994 the first major report, titled *The Toxicity of Soybeans and Their Related Products. Vol. 1. Scientific Reports, Laboratory Analyses, Field Observations,* was compiled and published by Valerie and Richard James. To get it reviewed around the world cost the two about $100,000 of their own money–just to get started. They thought that if they handed this peer-reviewed report to their own [New Zealand] government, they would act. Since, they have spent an additional $250,000 protecting and educating themselves. For example, soy infant formula contains about 150 times more carcinogens than is permitted under U.S. law–and most of the soy milks on the market contain about 50 times more. It has been general knowledge for about 50 years that these phytoestrogens are carcinogens–put nobody had ever gone and proved it. Even the toxicologist at the local medical school, who did an independent peer review of the 1994 report, wrote an essay for one of the local newspapers about the carcinogenic effects. Unfortunately it was never published die to pressure from the soy industry. Address: 1868 Whangarei Heads Road, Rural Delivery 4, Whangarei. Phone: +64 9 434 0564.

1548. James, Richard F.; James, Valerie. 1998. Re: Work to expose the dangers of toxic substances in soybeans. Letter (fax) to William Shurtleff at Soyfoods Center, April 19 to June 17. Handwritten (faxed).
• ***Summary:*** The record is for numerous handwritten letters, usually signed by Dick James, but sometimes also by Valerie James. Many of the letters where accompanied by faxed photocopies of key published documents. The page numbers that follow refer only to the number of pages in each letter itself, not including the accompanying faxed photocopies. (1) April 19. 2 p. (2) April 20. 2 p. (3) April 21. 1 p. (4) May 3. 2 p. (5) May 5. 2 p. (6) May 6. 1 p. (6) May 11. 2 p. (7) May 12. 1 p. (8) May 13. 1 p. (9) May 13. 1 p. (10) May 15. 1 p. (11) June 17. 1 p. Address: 1868 Whangarei Heads Road, Rural Delivery 4, Whangarei. Phone: +64 9 434 0564.

1549. Fitzpatrick, Mike G. 1998. Re: Oppose petition by ADM for soy isoflavones to be generally recognised as safe (GRAS). Letter to Dr. A.M. Rulis, Office of Premarket Approval (HFS-200), Center for Food Safety and Applied Nutrition, Food and Drug Administration, 200 C St. SW, Washington, DC 20204, May 1. 9 p. Typed, with signature on letterhead. [4 ref]
Address: PhD, MNZIC, Senior Consultant, Kingett Mitchell & Associates Ltd., Environmental Consultants, ASDA Plaza, Fred Thomas Dr., P.O. Box 33-849, Takapua, Auckland, New Zealand.

1550. Nordquist, Ted. 1998. Sanitarium Foods' So-Good soymilk now being made in Canada by Dairy World (Interview). *SoyaScan Notes.* May 28. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Sanitarium Foods is Australia's leading soymilk manufacturer. Their flagship soymilk product, based on isolated soy protein, is named So-Good. In a joint venture between Sanitarium Foods and the Canadian company Dairy World, So-Good is now being made in Canada.

So-Good, with sales in Australia of about $70 million a year, has roughly 85% of the Australian soymilk market. Sanitarium Foods' total sales are said to be about $130 million a year. The company is also Australia's leading manufacturer of breakfast cereals, and they been very successfully in using their cereal advertisements and packaging to promote their soymilk. Address: TAN Industries, Inc., 49 Stevenson St., Suite 1075, San Francisco, California 94105-2975; 660 Vischer Ct., Sonoma, CA 95476. Phone: 415-495-2870.

1551. Swain, Pauline. 1998. Soya good: Soya and linseed to beat hot flushes? *Dominion (New Zealand).* May 28. p. 15. [1 ref]
• ***Summary:*** These two foods are thought to reduce the ill-effects of both female and male menopause and appear to protect against some types of cancers. A photo shows four breads that contain both soya and linseed. Address: Sint by Mike Kirkpatrick of NZ 1998.

1552. James, Richard F. 1998. Re: Answers to questions by William Shurtleff related to photocopies sent by James. Letter (fax) to William Shurtleff at Soyfoods Center. Handwritten. Undated.
• ***Summary:*** (1) Columbit (NZ) Ltd. is the sole importer of soy protein isolate. It is owned equally (50/50) by Protein Technologies International (PTI) and Bruce Kirk. Kirk is the heavy-breathing late night phone call expert who was handing out threats of hell fire, etc. to Prof. Irvine, Dr. Fitzpatrick and his employees, Bill Grayson, and us.

(2) "Tofu shop" at the top of a fax (with fax #631 0616) is a suburban health food shop in Penrose, Auckland, on the north island of New Zealand. It is a retail outlet for Trevor Johnston's business, Bean Supreme (Brings Happiness). Address: 1868 Whangarei Heads Road, Rural Delivery 4, Whangarei. Phone: +64 9 434 0564.

1553. Fitzpatrick, Mike G. 1998. Re: Soya-based infant formulas. Letter to S. Kimberley Belshé, California Dep. of Health Services, 714/774 P Street, P.O. Box 942732, Sacramento, CA 94323-7320, June 3. 6 p. [41 ref]
• ***Summary:*** This carefully considered and well documented letter begins: "Further to our letter date 18 May 1998, please find enclosed material relevant to Mrs. Valerie James' request that your agency consider the potential health issues associated with feeding soy-based formulas and the safety of soy products in general.

"Soy-based infant formulas and the majority of soy products contain a class of compounds known as isoflavones. Mrs. James is of the opinion that the soy isoflavones have significant potential for reproductive and developmental toxicity in infants fed soy-based formulas and from infant foods in general. With respect to evidence to evidence that the soy isoflavones cause reproductive or developmental toxicity, the following should be noted:

The author then lists ten problems or potential problems from soy isoflavones in infant diets, each backed by one or more references to scientific studies. He continues: "Given this weight of evidence, Mrs. James holds the opinion that soy-based infant formulas are adulterated citing Section

110545 of the California Health and Safety Code, 'Any food is adulterated if it bears or contains any poisonous or deleterious substance that may render it injurious to health of man or any other animal that may consume it. The food is not considered adulterated if the substance is a naturally occurring substance and if the quantity of the substance in the food does not render it products to herbal medicines stating that the 'confidence that soy products are safe is clearly based more on belief than hard data'."

Note: Copies this letter were sent to Senator Barbara Boxer, Senator Frank Lautenberg, and Mrs. Valerie James. Address: PhD, MNZIC, Senior Consultant, Kingett Mitchell & Associates Ltd., Environmental Consultants, ASDA Plaza, Fred Thomas Dr., P.O. Box 33-849, Takapua, Auckland, New Zealand. Phone: (09) 486-8068. Fax: 486-8072.

1554. *SoyaScan Notes.* 1998. Tofu, Alzheimer's disease, and Lon White of Hawaii (Overview). June 16. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** On June 16 Trevor Johnston called from New Zealand to say that a big splash had been created by an article linking consumption of tofu and Alzheimer's disease. He phoned and talked with Lon White, who conducted an epidemiological study on this subject, in Hawaii.

Talk with Mark Messina. June 17. Lon White's study has never been published. Mark has traveled to Hawaii to talk with Lon about the study–which raises many interesting questions.

1555. Kikkoman Corporation. 1998. Annual report 1997. 339 Noda, Noda-shi, Chiba 278, Japan. 26 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1998. Contents: Financial highlights. Profile. A message from the president (Yuzaburo Mogi): The year in review, foundation, growth, and opportunity, serving a global market, toward the new century. A strong global operating presence: The Americas, Europe, Asia and Oceania, Japan. Operational review. Financial review. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to October 1997). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

During fiscal 1997, ended 31 December 1997, consolidated net sales worldwide rose 4.0% over the previous fiscal year to 214.3 billion yen, breaking the record of 211.7 billion yen set in 1992. Yet income decreased by 21.6% to 5.711 billion yen.

Overseas sales expanded 10.6% in 1997 to 60.1 billion yen, and accounted for 28.0% of consolidated net sales.

The Americas: "In June 1998, Kikkoman Foods, Inc., the centerpiece of Kikkoman's expansion in North America, will celebrate 25 years of operations. The number of items produced at the plant has risen to more than 100, and the plant's production has expanded more than 10-fold."

"On April 17, 1998, Kikkoman commenced operations at its second U.S. plant, in Folsom, California. Built at a cost of US $46 million, the plant covers an area of approximately 210,000 square meters and has an initial annual production capacity of 10,000 kiloliters of soy sauce. In autumn 1998, the Company will begin delivering soy sauce produced at its second U.S. plant, in Folsom, California."

"Kikkoman's English-language Internet home page, opened in April 1997, receives approximately 100,000 hits a month, mainly from people in the United States. In particular, the recipes listed on the home page have attracted a great deal of interest, with site visitors frequently requesting further recipe information."

Europe: In Oct. 1997 Kikkoman Foods Europe B.V. began operation of its plant in the Netherlands.

Letter from Keiji Yamazaki of Kikkoman, San Francisco. 1998. Aug. 7. Kikkoman's annual reports are published in mid-June each year. Address: Noda, Japan.

1556. **Product Name:** Soyganic.
Manufacturer's Name: Sunrise Markets Inc.
Manufacturer's Address: 729 Powell St., Vancouver, BC, V6A 1H5, Canada.
Date of Introduction: 1998. June.
Wt/Vol., Packaging, Price: Paperboard tub.
How Stored: Frozen.
New Product–Documentation: Talk with George Conquergood, Vice-president of Operations, International ProSoya Corp., Surrey (Vancouver), BC, Canada. 1999. SoyaWorld presently markets three soymilk products: Sunrise soymilk (a beany-flavored product made and packaged by Sunrise in plastic bottles), Soyganic (a traditional beany-flavored product made by Sunrise with organic soybeans, packaged at Dairyworld in a gable-top carton and sold refrigerated), and So-Good (licensed from Sanitarium Health Food Co. in Australia, formulated and packaged in gable-top by Dairyworld, and based on soy protein isolates). Soyganic and So-Good appeared on the shelves at about the same time in 1997 under the Soyaworld brand. They distribute those three products extensively across western Canada, and sell them in the dairy case.

ProSoya News release. 1999. May 17. *Soyganic* is an organic soy beverage fortified with calcium and other essential nutrients.

Talk with Peter Joe, owner of Sunrise Markets. 1999. May 26. In late 1997 the Canadian government first allowed soymilk to be fortified with calcium and vitamins. This showed a weakening of their many laws designed to protect dairy products. Use of the word "milk" is still not allowed. Soyganic was launched in mid-1998.

1557. Quick, Graeme R. 1998. Re: The combine and the tractor in soybeans in the United States. Letter to William Shurtleff at Soyfoods Center, July 10. 1 p. Typed, with signature on letterhead.

• ***Summary:*** "I agree with your observation that the combine could never have made it into soybean fields in a serious way without the tractor. But that only refers to the soybean because the combine was already into commercial production and usage for cereal crops well before the turn of the century. Also self-propelled and tractor mounted or towed combines were well established in cereal grain (Curt Baldwin in Kansas for example) well before 1923."

Note: Graeme Quick, an Australian who got PhD at Iowa State University, is an expert on this history of the combine. Address: Leader, Power & Machinery Section, Dep. of Agricultural and Biosystems Engineering, Davidson Hall, Iowa State Univ., Ames, IA 50011-3080. Phone: 515-294-1320.

1558. Hymowitz, Ted. 1998. Revising the genus *Glycine* is Australia (Interview). *SoyaScan Notes.* Aug. 9. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Lynn Craven, an Australian taxonomist, is the leader in this work. He is at the Australian National Herbarium, Div. of Plant Industry, CSIRO, GPO Box 1600, Canberra, ACT (Australian Capital Territory) 2601, Australia. He has his name on the last 5-6 wild *Glycine* species that have been discovered. Many new species will be added to the genus. This is not the renaming of known species but the discovery of new ones. As collections have increased, taxonomists have noticed that there is diversity that was formerly overlooked. Some differences were never seen before, other differences were due to mixtures of species that are now seen as different. This is due to increase in collections (many more specimens collected), not to cladistics or any new analytical tools. In the 1800s, Bentham had 6 species, but he was sitting in England and could only write up what he saw. Then Hermann (1962) revised the genus, adding new species. But starting in 1976 Ted and others began a new level of activity in collecting *Glycine* germplasm. Today Ram Singh is hybridizing and crossing; some of the results make sense, and others don't. Ted's lab has pressed specimens of everything they have collected, and he has now sent most of these to Australia–at the request of the Australians.

Now there are 16 species in the genus; Ted would guess that there might be 24 species in the genus when this round of revision is finished. *Tomentella* will be broken up into 3-4 additional species. *Hirticaulus* also seems to be a problem. The pattern was set in the 1997 article titled "Phylogenetic and genomic relationships in the genus *Glycine Willd.* based on sequences from the ITS region of nuclear rDNA," by Kollipara, Singh, and Hymowitz. The Australians are building on that, and adding more to it. The taxonomists are on the forefront. The experimentalists will then see whether or not their analysis of species is valid.

All wild perennial relatives of the soybean have purple flowers; white flowers are the result of human intervention. Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1559. Ndungi Khoto, Aubry. 1998. Contribution a l'avant-projet d'une usine de production de *lait de soja* en poudre a Lubumbashi [Contribution to the rough draft for a factory for the production of soymilk at Lubumbashi, Congo]. Civil Engineer thesis, University of Lubumbashi, Polytechnic Faculty, Dep. of Industrial Chemistry. v + 154 + 16 p. Illust. 30 cm. [73 ref. Fre]

• ***Summary:*** Preface and dedication. Introduction. Part I: Review of the literature. 1. General information about soya and proteins: 1.1. The soybean (Botanical, origin and history, soybean production and commerce worldwide, soya in the Democratic Republic Republic of the Congo {Congo, formerly Zaire}, structure and composition of soybean seeds, utilization of soybeans {with diagram}, food uses of soybeans {oil and meal, soy flour (4 types), soy concentrates and isolates, textured soy proteins (TVP, thermoplastic extrusion, spun fibers}, soymilk, tofu, other uses (shoyu, miso, tempeh, yuba)}, industrial uses of soybeans {linoleum, plastics, paints, varnishes, etc.}). 1.2. Proteins (in the human body, in foods), the structure of proteins (amino acids, ionization and acid-base properties of amino acids), protein bonds, denaturation. 1.3. Soya proteins (glycinin or globulin 11S, globulin 7S, hemagglutinins or lectins, protein inhibitors and other antinutritional factors, amino acid composition of soy protein). 1.4 Factors affecting the food value of soya: Acceptability problem (food value of raw soybeans), intolerance to soy proteins, off-flavors in soya and their source, inactivation of lipoxygenase, other treatments affecting the food value of soya: Alkalis.

2. Preparation and properties of soymilk. 2.1. Properties. 2.2. Advantags and disadvantages of soymilk compared with cow's milk. 2.3. Preparation. 2.4. Commercial / industrial production using the Alfa-Laval process.

3. Reminder of certain operations required for the preparation of soymilk powder: 3.1. Homogenization. 3.2. pasteurization and sterilization. 3.3. Concentration by evaporation. 3.4. Drying by atomization. 3.5. economies of energy in dewatering operations.

4. Some ideas on the methods of sensory evaluation: 4.1. The different methods. 4.2. Results and interpretations.

5. Important ideas in the study of the market, in determining the capacity of production, and in the economic evaluation of a project: 5.1. Study of the market. 5.2. Determining the capacity of production. 5.3. Economic

evaluation of a project, incl. estimating fixed capital by adding capital costs.

Part II: Experimental, industrial calculations, economic calculations. Introduction. 6. Origin and characterization of the raw materials, trials for inactivation of lipoxygenase. 7. Determination of the optimal conditions for the preparation of soymilk. 8. Results of pilot plant trials. 9. Market study and determination of the capacity of production. 10. Description and calculations for the installation. 11. Economic evaluation of the project. General conclusion.

Tables show: (1) Number of people that can be supported for 1 year by the production from one acre devoted to certain crops and animals. Fewest: Beef 190. Pork 319. Poultry 457. Most: Potatoes 5,329. Split peas 6,901. Soybeans 9,075. Algae 43,200–154,000. Yeast 3,275,000. (1.1) Leading soya producing countries in 1985 (worldwide, with area, production, and yield; USA, Brazil, China, Argentina, India). (1.2) Leading soya producing continents in 1985 (North and Central America, South America, Asia, USSR, Europe, Africa, Oceania). (1.3) Leading soya trading countries in 1985. Importers: Japan, Netherlands, R.F.A. (Republique Federal Allemagne = Germany), Spain, Italy. Exporters: USA, Brazil, Argentina, China, Paraguay. (1.4) Production of soya in the Congo, by province 1970-1978 (the leading producer by far in 1978 was Western Kasai). (1.5) Production of soya in Katanga [formerly Shaba, before that Elisabethville] (1990-1994; by far the leading producer is Tanganyka). 1.6 Total production of soya in the Congo (1,000 metric tons) from 1970-1995 (increased from 1.7 in 1970-74 to 18 in 1995). (1.7) Average composition of different parts of the soybean seed. (1.8) Physico-chemical composition of soybean seed (ranges and average). (1.9). Mineral content of soybeans. (1.10). Vitamin content of mature soybean seeds and soybean meal. (1.11) Fatty acid composition of soybean oil. (1.11A) Enzymes in the soybean: Lipoxidase, urease, lipases, beta-amylase. (1.12) Properties and characteristics of the water-soluble fractions of soybean seeds. (1.12A) Variations in the solubility of proteins from defatted soy flour at various pH levels. (1.12B) Amino acid composition of soybean protein. Address: Lubumbashi, Katanga Province, Congo.

1560. *Soya & Oilseed Bluebook.* 1998—. Serial/periodical. Bar Harbor, Maine: Soyatech, Inc. Peter Golbitz, publisher and editor. Frequency: Annual.
• ***Summary:*** Preceded by Soya Bluebook Plus. A directory and information book for the soybean processing and production industries. The first issue (shipped Sept. 1998) is subtitled "The annual directory of the world oilseed industry." On the cover, below a map of the world is printed the date "1999" in large letters, followed by "A Soyatech Publication." Crops featured on the front cover and inside are "soya, corn, cottonseed, canola, rapeseed, sunflowerseed, palm kernel, palm, coconut, and peanut."

Contents (the four main sections are marked with a fold-out tab): Translations of oilseed terminology (English, German, French, Spanish, and Portuguese). Organizations and government agencies: Complete listings by country. Oilseeds and oilseed products: White pages (Index, individual crops), catalog pages, yellow pages (complete company listing by country). Equipment supplies and services. Oilseed statistics. Oilseed reference: Oilseed glossary, standards and specifications, oilseed technical charts and tables. Indexes: Comprehensive index, internet address index, brand name index, advertiser index.

Soy-related terms appearing in the translation section (p. 9-15) are: (1) Oilseeds and products: dairy analogs, lecithin–edible, lecithin industrial, meat analogs, miso, organic soy products, soy distillate, soy fiber, soy flakes–defatted–edible, soy flakes–full fat, soy flour–defatted, soy flour–enzyme active, soy flour–full fat, soy flour–low fat, soy flour–roasted, soy flour–textured, soy grits, soy isoflavones, soy livestock feed, soy oil margarine, soy oil shortening, soy oil–crude, soy oil–edible, soy oil–hydrogenated, soy oil–industrial, soy oil–refined, soy oil-based fuel, soy protein concentrate, soy protein isolate, soy protein–hydrolyzed, soy protein–industrial, soy sauce, soy sterols & tocopherols, soy-based foods–other, soybean fatty acids, soybean hulls, soybean meal, soybean meal–full fat, soybean seed breeder, soybean seed (for planting), soybean soapstock, soybeans–food grade, soybeans genetically modified, soybeans–green vegetable, soybeans–identity preserved, soybeans–non-gmo, soybeans–organic, soybeans, whole dry, soymilk beverages, soymilk powder, soynuts, tempeh, tempeh starter cultures, textured vegetable protein, tofu & tofu products, tofu powder. (2) Equipment & services: Coagulants for tofu, soymilk & tofu processing equipment, sprouting equipment. Address: 318 Main St., P.O. Box 84, Bar Harbor, Maine 04609. Phone: 207-288-4969.

1561. Harrigan, Brian. 1998. ProSoya Inc. and International ProSoya Corp. (Interview). *SoyaScan Notes.* Oct. 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** ProSoya Inc. and International ProSoya Corp. (IPC) are definitely two separate organizations; each is very different in its activities and philosophy. IPC was not created out of ProSoya, but rather as a separate entity with different owners to license ProSoya's large-scale soymilk technology. This relationship as licensee still exists. IPC does not make equipment or sell equipment worldwide; they make soy products using ProSoya's technology. ProSoya has some ownership in IPC and they have a very small ownership in ProSoya Inc. People do associate these two companies, not realizing that they are totally separate. This

confusion (and some things that people from IPC have said and done) has caused ProSoya quite a few problems.

ProSoya does not presently make any soyfood products. The plant on Canotek Road (in Gloucester, near Ottawa), where they used to make some products and have their offices, was originally used solely for R&B, but it expanded so much that it eventually also became a commercial soyfoods production facility. In Oct. 1996 ProSoya sold this plant to IPC and in Jan. 1997 ProSoya moved to separate offices about 500 feet away, on the same road; there they have offices plus a small area at the back for R&D, shipping, and receiving. ProSoya can still take customers and others to see this plant and its operation, but sort of as visitors.

ProSoya is an R&D and technology company. Their equipment is manufactured by other companies (as in India and Russia) for them.

There has been quite a shake-up at IPC recently and things there are rather chaotic. Their soymilk, SoNice was the number one seller in Canada while it was out. It was made in two plants–in Vancouver (BC) and in Ottawa (Ontario, on Canotek Rd.). It's arrival expanded the market for all soymilks sold in Canada; so while Edensoy and Vitasoy lost market share to SoNice, they actually saw their sales volume increase. But recently IPC has had major problems their soymilk; it is no longer being manufactured, but small amounts are still left in the retail pipeline. The product is good, but it is mostly financial factors that have caused it to disappear from the market. IPC has not really commercialized their soy yogurt yet, except perhaps on a small scale for the Vancouver area–and there they were having problems with the formulation, though not with the taste. For more details, contact George Conquergood, who is the vice-president of operations. He is quite open in telling interested people what is happening. The plant in Scotland is a totally separate venture from IPC; Dusty is still there.

A new brand of soymilk in Canada is SoGood. Based on soy protein isolates, it is the same as that made by Sanitarium Foods in Australia. In Canada, it is made (mixed and packaged) under license from Sanitarium by Sunrise (owned by Peter Joe) in Vancouver. Sunrise and Dairyworld (the biggest dairy in Canada) now have a joint venture named SoyaWorld. Dairyworld distributes SoGood soymilk along with their line of dairy products. SoGood is now doing very well in Canada. When SoNice was on the market, it had a bigger market share than SoGood. But SoGood conducted a national advertising campaign that cost several million dollars, and greatly helped their sales. Brian finds the flavor of SoGood rather artificial and the list of ingredients is very long, so consumers tended to prefer the more natural and better tasting SoNice–until it ceased to be available.

Raj Gupta is now more involved with ProSoya Inc, than ever before. He comes to the office every day. When he started ProSoya he was working for the National Research Council (NRC) and working with ProSoya part-time on the side. Now he works on ProSoya full time; about 3 years ago he gave up his position at NRC. ProSoya was growing so much that the company need his full-time presence, and could afford to pay him what he needed.

Note: Other sources say that IPC recently declared bankruptcy. Address: Executive Vice-President, ProSoya Inc., 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. Phone: 613-745-9115.

1562. Fitzpatrick, Mike; Dibb, Sue. 1998. Soy infant formula–The health concerns: A Food Commission briefing paper. London, England: The Food Commission. 6 p. [47 ref]

• ***Summary:*** Contents: Background. Eleven health concerns. Removing isoflavones from infant formula. References.

This paper begins: "In July 1996 the UK Department of Health warned that phytoestrogens found in soya infant formulas could affect the health of infants. Issuing advice to health professionals, the Chief Medical Officer, Sir Kenneth Calman, said soya formula should only be given to babies on the advice of a health professional... In 1996 the UK government's Food Advisory Committee asked companies to investigate the removal of soy isoflavones from soy-based infant formulas but, despite evidence that this is possible (see below) companies have not yet done so."

The paper concludes: "The Food Commission believes it is irresponsible for manufacturers of soya formula to continue to place infants at unnecessary risk of exposure to phytoestrogens and we request the immediate removal of phytoestrogens from soya infant formulas." Address: 1. PhD, New Zealand; 2. The Food Commission (a consumer advocacy group), 94 White Lyon St., London N1 9PF, England. Phone: 0171 837-2250 (Dibb).

1563. Singh, Ram J.; Kollipara, K.P.; Hymowitz, T. 1998. The genomes of *Glycine canescens* F.J. Herm., and *G. tomentella* of Western Australia and their phylogenetic relationships in the genus *Glycine* Willd. *Genome* 41(5):669-79. Oct. [55 ref]
Address: Dep. of Crop Sciences, Univ. of Illinois, Urbana, IL 61801.

1564. *Soyafoods (ASA, Europe)*. 1998. Food industry innovation award for soya and linseed bread. 9(3):2. Autumn.

• ***Summary:*** The 1998 Australian Institute of Food Science & Technology (AIFST) Food Industry Innovation Award has been presented to two teams of researchers for their research and development of the Burgen Sou-lin, a bread which contains soy grits and whole linseed. The loaf was designed to have high levels of phytoestrogens to help reduce menopausal symptoms in women.

For further information contact Weston Food Laboratories, Sydney, Australia. Phone: +61 (0)2 9764 8222. Fax: +61 (0)2 9742 5959.

1565. James, Richard F. 1998. Re: Monsanto Australia Ltd. application A 338: Addition of protein CP 4 EPSPS. Letter to Mr. Hugh Baber, General Manager, A.N.Z.F.A., P.O. Box 10-559, Wellington New Zealand, Dec. 13. 18 p. . [65 ref]
• ***Summary:*** This is Mr. James' "response to Monsanto's application to have their Round-Up Ready Soybeans and products derived from Round-Up Ready Soybeans added to the list of Foods derived from Gene Technology which are approved for human consumption." Contents: Logical fallacies in Monsanto application concerning current soya protein based products. Factual inaccuracies: Introduction (possible health risks to infants and young children, high soy consuming vegetarians, pregnant women), trypsin inhibition, other toxins, isoflavones, safety issues. Regulatory requirements/compliance: Processing safety USA (nitrosamines, lysinoalanines, nitrite), international. Processing anomalies. Glyphosate residues. Conclusion: Urges that Monsanto's application be refused. Address: MBA, LLD, RD 4, Whangarei, New Zealand. Phone: +64 9 934 0564.

1566. *GMF–Genetically Modified Foods Market Intelligence (Genetic ID, Fairfield, Iowa).* 1998. Labeling news. No. 27. Dec. 23. p. 3-6.
• ***Summary:*** Contains three articles: Japanese want labels. New Zealand claims pressure. U.S. chefs campaign for labels.

1567. Birkbeck, John. 1998. Current understanding of soy and infant health–Debate on possible hazards of soy infant formulas: a view from New Zealand (Abstract). *American J. of Clinical Nutrition* 68(6S):1534S. Dec. Supplement.
Address: Heinz-Wattie Limited, Auckland, New Zealand.

1568. Dalais, F.S.; Rice, G.E.; Bell, R.J.; et al. 1998. Dietary soy supplementation increases vaginal cytology maturation index and bone mineral content in postmenopausal women (Abstract). *American J. of Clinical Nutrition* 68(6S):1518S. Dec. Supplement.
• ***Summary:*** Note: This is the earliest document seen (Jan. 2001) which shows an improvement in bone mineral content in humans with increased soy intake. Address: 1. Dep. of Medicine, Monash Medical Centre, Clayton Road, Clayton, VIC 3168, Australia; 1-3. Perinatal Research Centre, Royal Women's Hospital, Grattan Street, Carlton, VIC 3168, Australia.

1569. Eden, John; Knight, D.; Mackey, R. 1998. Hormonal effects of soy–Postmenopausal studies: Hormonal effects of isoflavones (Abstract). *American J. of Clinical Nutrition* 68(6S):1532S. Dec. Supplement.
Address: Frank Rundle House, Royal Hospital for Women, Paddington, NSW 2021. Australia.

1570. Irvine, Clifford H.G.; Shand, N.; Fitzpatrick, M.G.; Alexander, S.L. 1998. Daily intake and urinary excretion of genistein and daidzein by infants fed soy- or dairy-based infant formulas. *American J. of Clinical Nutrition* 68(6S):1462S-65S. Dec. Supplement. [26 ref]
Address: 1. AVSG (Animal and Veterinary Sciences Group), Lincoln Univ., Box 84, Canterbury, New Zealand 3-325811.

1571. Joannou, G.E.; Silink, M.; McVeagh, P.; Kelly, G.E.; Waring, M.A. 1998. Current understanding of soy and infant health–Determination of dietary soy isoflavone exposure in infants fed breast milk, cow milk, or soy formula (Abstract). *American J. of Clinical Nutrition* 68(6S):1535S. Dec. Supplement.
Address: 1-3. The New Children's Hospital, Hawkesberry Rd., Westmead, NSW 2145, Australia; 4-5. Norvet, Ltd., 140 Wicks Rd., N. Ryde, NSW 2113 Australia.

1572. King, Roger A. 1998. Daidzein conjugates are more bioavailable than genistein conjugates in rats. *American J. of Clinical Nutrition* 68(6S):1496S-99S. Dec. Supplement. [23 ref]
Address: Commonwealth Scientific and Industrial Research Organization (CSIRO), Div. of Human Nutrition, PO Box 10041, Gouger St., Adelaide, South Australia 5000.

1573. Murkies, Alice L.; Lombard, C.; Strauss, B.J.G.; et al. 1998. Hormonal effects of soy–Postmenopausal studies: Postmenopausal hot flushes decreased by dietary flour supplementation: effects of soy and wheat (Abstract). *American J. of Clinical Nutrition* 68(6S):1532S-33S. Dec. Supplement.
• ***Summary:*** In a randomized double-blind study, 23 women received 45 gm of soy flour daily and 24 women received 45 gm of refined wheat flour daily for 12 weeks. Hot flushes significantly decreased in the soy flour group (40%) and in the wheat flour group (25%). In the soy flour group, this significant response occurred within 6 weeks and continued through 12 weeks. The score for the severity of menopausal symptoms decreased significantly in both groups. Urinary daidzein, equol, and enterolactone increased significantly within the soy flour group. Conclusion: "It may be possible to use soy flour... in the treatment of hot flushes in some women." Address: Brighton Medical Center, Brighton; Jean Hailes Foundation, Clayton; Clinical Nutrition and Metabolism Unit and Prince Henry's Inst. of Medical Research, Monash Medical Centre,

Clayton; and Registrar in Diabetes and Metabolism, Caulfield General Medical Centre, Caulfield, Victoria, Australia; and Tenovus Cancer Research Centre, Univ. of Wales, College of Medicine, Cardiff, Wales.

1574. Australian College of Pediatrics. 1998. Position statement: Soy protein formula. *J. of Paediatrics and Child Health* 34:318-19. *
• ***Summary:*** The Australian College of Paediatrics (ACP) has revised its position statement on soya-based infant formula. As in New Zealand and the UK, the advice is that soya formula should only be used when recommended by a health professional for specific medical conditions such as proven cow's milk protein or lactose intolerance. However, even in these circumstances, the authorities recommend the use if alternative non-soy-based infant formula. The ACP statement also says there is some evidence that soy formula may impair immunity and that the long-term effects of contaminants in the formula (e.g., aluminum and phytoestrogens) are unknown.

1575. Burnham, Trudie. 1998. Innovative soy cooking. Freedom, California: The Crossing Press. 95 p. No index. 15 x 18 cm.
• ***Summary:*** Contents: Preface. Introduction. Appetizers, snacks, and side orders. Salads. Dressings and toppings. Main dishes. Beverages. Desserts and treats.

The introduction begins: "Let's face it. In a society like ours, obsessed with fast, low-fat food, tofu is the ultimate answer." This is a "user-friendly guide to a soya-based vegetarian diet. Many recipes are vegan, or use a minimum of dairy foods.

The glossary of ingredients includes kelp, kudzu, lecithin, mirin, miso, nutritional yeast, oils (use expeller pressed), sea vegetables, seeds (Sunflower, pumpkin, poppy and sesame are used for eating; alfalfa, radish, red clover, and fenugreek are for sprouting), slippery elm powder, soy milk, soy sauce, soysage, sweeteners, tahini, tempeh, tofu, umeboshi plums, vinegars.

"Missing egg salad: I invented this and word seemed to travel fast and wide, because I saw it in a California deli a year later with the same name." Address: New Zealand.

1576. Fallon, Sally; Enig, Mary G.; Fitzpatrick, Mike. 1998? Myths and truths about soy foods (Leaflet). Whangarei, New Zealand: Soy Information Service. 3 panels each side. Front and back. Each panel: 21 x 9.5 cm. Undated.
• ***Summary:*** Near the bottom of the front is written: "For references and additional information, send $12 to: Soy Alert! 4200 Wisconsin Ave. #106-336, Washington, DC 20007. Copyright Sally Fallon and Mary G. Enig, Ph.D."

The three inside panels are titled "Myths and truths about soy foods." There are 16 pairs of "Myth" and "Truth." The first few myths are: "The use of soy as a food dates back several thousand years." "Asians consume large amounts of soy foods." "Modern soy foods confer the same benefits as traditionally fermented soy foods." Note: The authors are not opposed to the use of traditional fermented soyfoods.

Back left panel: "Soy dangers summarized." Back central panel. "Soy infant formula–Birth control pills for babies."

Note: This leaflet was sent to Soyfoods Center in about 1998 by Richard James of New Zealand. A note stapled to the back reads: "The point being that the industry and the F.D.A. have allowed an unacceptable cancer risk [from soy isoflavones] to continue, especially in baby food, for 20 years." Address: P.O. Box 3285, Onerahi, Whangarei, New Zealand.

1577. Fitzpatrick, Mike G. 1999. Re: Docket No. 98P-0683 [Food labelling: Health claims; soy protein and coronary heart disease]. Letter to Dr. S.M. Pilch, Centre for Food Safety and Applied Nutrition (HFS-465), Food and Drug Administration (FDA), 200 C St., SW, Washington, DC 20204 USA, Jan. 25. 9 p. [40 ref]
• ***Summary:*** "My submission does not address the issue of the health claim that soy protein reduces the risk of coronary heart disease *per se*. Rather, it opposes the claims by PTI [Protein Technologies International] that soy protein is a GRAS foodstuff and that there are no risks associated with the daily consumption of between 25 g and 100g of soy protein.

"In fact, the FDA has never granted soy protein GRAS status. I would submit that the proof required to make such a claim is lacking. Also, there are very real risks associated with consuming soy protein. These risks appear to have been ignored by PTI and it is essential that the FDA give their full attention to the exposures to isoflavones and nitrosamines that will occur on daily exposure to 100g of soy protein.

"In this regard, FDA must fully disclose to consumers the possible risks of soy protein as well as the possible benefits." Address: PhD, MNZIC, Senior Consultant, Kingett Mitchell & Associates Ltd., Environmental Consultants, ASDA Plaza, Fred Thomas Dr., P.O. Box 33-849, Takapua, Auckland, New Zealand. Phone: (09) 486-8068. Fax: 486-8072.

1578. Harter, Lisa. 1999. Protein Technologies International now offers certified non-GMO isolates suited to each customer's needs (Interview). *SoyaScan Notes.* Feb. 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** PTI began to offer certified non-GMO isolates in the fall of 1998. The demand for this type of product was driven largely by enquiries from customers in Europe, but also from Australia and New Zealand. Starting September 1, 1998, food manufacturers in the EU (European Union) were

required by labeling laws to list GMO products in the ingredients listing. More than 65% of PTI's business is outside the United States.

In order to ensure that the isolates are free of genetically engineered soybeans, PTI (starting in 1998) contracted with farmers to grow non-GMO soybeans; after they were harvested, the soybeans were stored in special silos. The beans are crushed (by a crusher with whom PTI has a contract), the oil extracted, and the resulting flakes made into soy protein isolates using the water-wash process–the same process to make all PTI isolates–which keeps isoflavone levels high. PTI audited the process (which they call an "identity preserved" {IP} process), and can provide certification to any customer that buys one of these products saying "This product comes from a non-GMO source."

PTI has to schedule production runs of non-GMO isolates in advance, and the company attempts to notify existing or potential customers far in advance as to when these runs will take place. Each time PTI does such a run, they have to shut down the plant and clean out their entire production line, to ensure there is no "contamination"–which is quite expensive and complicated. Thus the non-GMO isolates are more expensive than the regular isolates.

It is important to understand that PTI develops each product to suit the needs of individual customers. Although they now offer more than 100 different types of isolates, they are a customer-driven rather than a product-driven company. They do not send out a laundry list or a catalog. They do not have a brochure describing their policies on non-GMO. Their product offerings are changing constantly.

Talk with Jim Skiff (phone: 217-235-1020) of US Soy, LLC. 1999. May 12. PTI makes the isolates that it calls GMO-Free from STS soybeans, which are resistant to DuPont's powerful herbicide named Synchrony, but are not genetically engineered. So STS soybeans, bred by DuPont and others from mutant lines and first marketed in 1993, are kind of midway between traditional soybeans and GMO-soybeans. A deal involving STS soybeans makes sense since PTI is owned by DuPont, which has a major alliance with Pioneer Hi-Bred, which is the source of STS soybeans! When Jim and his partner, Ramlakhan Boodram, called PTI recently to ask their R&D people if they sell isolates which are guaranteed to be GMO-Free, they said that they did not, "because that would be impossible and the liability would be too great." PTI processes its STS soybeans in Bloomington, Illinois, at a plant owned by DuPont. It is extremely expensive to stop and clean out a plant such as this one. Address: Account Representative, Checkerboard Square St. Louis, Missouri 63164. Phone: 800-325-7108 PTI.

1579. Nutrisoy Pty. Ltd. 1999. Nutrisoy: Certified organic (Sell sheet). Banksmeadow, New South Wales, Australia. 1 p. Front and back.

• ***Summary:*** A large color photo on the top two-thirds of the front panel shows a young man and woman holding hands, walking in the woods, looking at each other. Below that, the text reads: One of the healthiest foods in the world. Across the bottom are three color photos, each 2½ inches square, showing the company's tofu, tofu dessert, and tempeh products.

On the back: "Nutrisoy: Fitness food." There is a brief history of the company and information about the health benefits of soyfoods. "Nutrisoy is an Australian family-owned company dedicated to producing high quality, good tasting, healthy foods. It was established in 1984." Color photos show: (1) The company's tofu and tempeh products. (2) The outside of the brick factory with three delivery vans. (3) Three stainless steel sinks containing cakes of tofu cooling in water. (4) Tofu being packaged in a heat-sealing machine. (5) A secretary typing at a computer.

Letter from Tony Wondal of Nutrisoy. 2007 Aug. 3. This leaflet was published in Feb. 1999. Address: Lot 1, 19a Baker St., Banksmeadow, NSW 2019, Australia. Phone: +61 2 9316 5171.

1580. Nutrisoy Pty. Ltd. 1999. Nutrisoy: Fitness food (Sell sheet). Botany, New South Wales, Australia. 1 p. Feb. Front and back. 30 cm.

• ***Summary:*** A large color photo on the bottom half of the front panel shows the company's tofu and tempeh products. Three paragraphs above that are titled: Nutrisoy. Tofu. Tempeh.

The back is titled "Nutrisoy products range." A color photo shows each of the company's products, by category. Plain and pre-marinated tofu: Plain Firm Tofu, Tofu Vegies, Tofu Tempeh, Tofu Herbs. Pre-cooked tofu and tofu burger: Tofu Spicy, Tofu Teriyaki, Tofu Vegies Burger, Tofu Tempeh Burger. Tofu deserts and silken tofu: Tofu cups in strawberry, apricot, mango, and tropical flavors. Silken tofu. Tempeh and tempeh burger: Plain Tempeh. Seasoned Tempeh. Mildly Spiced Tempeh. Tasty Tempeh (marinated in ginger and soy sauce). Tempeh Burger.

An attached, 1-page product list, gives the name and weight of all the company's products, including those under special or private labels such as Soyco, Nutal, and a few Indonesian names. They also sell hommus (hummus), chickpea veg. burger, spirulina juice, and berry juice.

Letter from Tony Wondal of Nutrisoy. 2007 Aug. 3. This leaflet was published in Feb. 1999. Address: 15 Hannon St., Botany NSW 2019, Australia. Phone: +61 2 9316 5171.

1581. Nutrisoy Pty. Ltd. 1999. Tofu & tempeh: For a high energy breakfast, quick lunch, or hearty main meal (Leaflet). 255 Forest Road, Arncliffe 2205, NSW, Australia. 3 panels each side. Feb. Front and back. Undated.

• ***Summary:*** This undated color leaflet contains recipes for tofu and tempeh, and shows color photos of the front panel of the company's products. One panel is dedicated to a short company history and descriptions of tofu and tempeh.

Letter from Tony Wondal of Nutrisoy. 2007 Aug. 3. This leaflet was published in Feb. 1999. Address: Arncliffe, NSW, Australia.

1582. Nutrisoy Pty. Ltd. 1999. Tofu & tempeh: The healthiest foods. Recipes (Leaflet). 15 Hannon St., Botany NSW 2019, Australia. 3 panels each side. Feb. Front and back. Undated.

• ***Summary:*** This undated color leaflet (Nutrisoy's 2nd) contains recipes for tofu and tempeh, and shows color photos of the front panel of the company's products. One panel is dedicated to a short company history and descriptions of tofu and tempeh. A color photo on the front panel shows a young man and woman holding hands, walking in the woods, looking at each other.

Letter from Tony Wondal of Nutrisoy. 2007 Aug. 3. This leaflet was published in Feb. 1999. Address: Arncliffe, NSW, Australia.

1583. Welch, Denis; White, Margo. 1999. The Frankenstein feud: Genetically modified food is already on the supermarket shelves and in your fridge. Your right to know what you are eating has been denied. *Listener (The) (New Zealand).* March 13. p. 16-20.

• ***Summary:*** First the good news: Scientific evidence is mounting that you *should* be worried about rating genetically modified (GM) food. About three months ago, Australia and New Zealand health ministers decided by a majority vote that all GM food would have to be labelled in the future. Fortunately, a regime for labelling genetically modified food is expected to be in force in New Zealand by May 1999. The Australia New Zealand Food Authority is now at work framing the regulations–"building, in effect, a stable door behind which this strange new beast of a food can be penned.

"The bad news is that the horse has already bolted." And the worse news is "that the government is not exactly making strenuous efforts to get it back."

Soy is used in 60% of processed foods–such as margarine, cereals, infant formula, pasta, bread and chocolate. The USA produces 85% of the world's soybeans, and last season 40% of that crop was genetically engineered."

"Welcome to your new diet. Nice of them to tell you, wasn't it. The whole history of GM food has been one of giant corporations pushing the stuff into the marketplace."

Some top officials in New Zealand think that a labelling program will be unworkable or too expensive. Yet Anzfa (the food authority) seems committed to it. Some think that "the government's reluctance to take a tough stand on GM food stems from its fear of offending the US, home of food technology giants such as Monsanto." Labelling could have a negative on the bilateral trade relationship.

Last week, attempts to establish the first global treaty regulating trade in GM foods collapsed when the US and four other big agricultural exporters rejected a proposal supported by about 130 other nations.

1584. *Food Magazine (Food Commission, London).* 1999. Soya safety questions. Jan/March. p. 8. No. 44.

• ***Summary:*** This magazine has expressed considerable doubts about the safety of soya-based infant formula, given the high levels of oestrogen-like chemicals found in such products, and the small body weights of babies. The soy industry has continued to deny any problems, but food giant Archer Daniels Midland Co. (ADM) has withdrawn it application to the US Food and Drug Administration to have its soya isoflavone products given a Generally Recognized as Safe (GRAS) status.

The company said it is "in the process of incorporating additional information to update the file." The FDA has been deluged by letters from campaigners in New Zealand and the UK, including the Food Commission, pointing out the scientific evidence for a potential hazard.

1585. *Food Magazine (Food Commission, London).* 1999. New soya baby milk warnings. Jan/March. p. 8. No. 44.

• ***Summary:*** In Dec. 1998 the New Zealand Ministry of Health published a new position statement on the use of soya-based infant formula, warning the isoflavones (phytoestrogens) in such formula may have the capacity to affect the thyroid function of infants. The new statement also recommends further research to determine whether there may be any other clinically significant interactions between phytoestrogens in this infant formula and endocrine function in infants.

1586. Nestel, Paul J.; Pomeroy, Sylvia; Kay, Sally; et al. 1999. Isoflavones from red clover improve systemic arterial compliance but not plasma lipids in menopausal women. *J. of Clinical Endocrinology and Metabolism* 84(3):895-98. March. [23 ref]

• ***Summary:*** Numerous references to soybeans are mentioned. Novagen (in Australia) makes a purified red clover isoflavone extract.

Nestel et al. (1997) reported that isoflavones from soybeans in amounts resembling consumption among Japanese improved arterial compliance in menopausal and perimenopausal women. This occurred without any reduction in plasma lipids.

A 1997 study in monkeys by Anthony et al. showed a significant reduction in coronary atherosclerosis with soy protein but not with soy protein from which the isoflavones had been removed. Researchers (including Tikkanen et al.

1998) have attributed these effects to the weakly estrogenic effects of these isoflavones, which also possess antioxidant properties. Address: Baker Medical Research Inst. and Latrobe Univ., Melbourne 8008; Novagen Ltd., North Ryde 2113, Australia.

1587. Conquergood, George. 1999. History of work with soyfoods and vegetarianism. Part III. Building Pacific ProSoya Inc. and making the base for Silk–1994 to 1996 (Interview). *SoyaScan Notes.* April 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: George (and Lorne) moved to Vancouver, BC to build a soymilk plant, launch a new soymilk product, and dedicate himself 100% to the soy business; his wife and family stayed in Saskatoon, where they all work in the family business. He is still married, he communicates with his wife and family daily, and they visit one another from time to time.

In Vancouver George and Lorne set up a new soymilk company named Pacific ProSoya Foods. The company had a license to make and sell soymilk, soymilk products, and soymilk equipment in British Columbia and Alberta in Canada, plus Washington, Oregon, and parts of California in the United States. In April 1995 the SC-2000 started to produce soymilk on a trial basis, but it took 8 months to debug the system. Pacific ProSoya's first commercial soymilk was sold in Jan. 1996 to Ted Nordquist of TAN Industries, who used it to make Silk brand soymilk for White Wave in Boulder, Colorado. George started the company, and he and Dusty basically built it up; Lorne, who had been George's accountant, put together the financing.

When IPC started, the company had no plans to make its own soy products. Rather it planned to make soymilk base and supply it to the dairy industry. So selling soy base to Ted Nordquist, their first customer, fell within this general concept. But Ted wasn't buying that much soymilk. George is quite sure IPC never shipped him more than one tanker of soy base (containing about 10% solids) a week; one tanker holds 6,000 gallons. They probably shipped him, on average, 12,000 to 18,000 gallons/month. Ted was formulating product for White Wave's Silk in the 4% solids area. So 1 volume of IPC base would end up as more than 2.5 volumes of Silk, or 37,500 gallons of Silk a month. And that was only several days a month production for IPC's plant. IPC had to do something, so they began spray-drying their organic soymilk in the hope of developing a wholesale market. They shipped large amounts (many container loads), because a broker in the USA led them to believe they could sell plenty. Eventually they did sell small amounts to the USA. One woman buyer ran a health food company that used it in a potato mix. She ordered several 50-lb bags at a time and didn't pay her bills well.

Initially the SC-2000 continuous process Soya Cow didn't work, so George worked with Raj to perfect the technology. This took a long time, and that delay is one thing that took the company so long to get into production.

Actually, International ProSoya Corp. (IPC) was established (incorporated) in 1996. Lorne wanted to negotiate a broader license for Pacific ProSoya Foods that encompassed the whole world. They got rights of first refusal in every country of the world (except the CIS countries of the former Soviet Union), plus an exclusive license for North America. Early in 1996, IPC was formed, licenses were granted, and then (as its first move) IPC bought ProSoya's plant in Ottawa, Ontario (from Raj), and formed a company named IPC Eastern. When IPC launched its first product, it was made in the Ottawa plant (which IPC owned) and packaged by Beatrice.

The company was running into problems in western Canada selling bulk soymilk. They could not convince the big dairy, Dairyworld, to buy milk and package it. But they did get Dairyworld to agree to package and distribute soymilk for them. They even offered Dairyworld a joint venture. Then, shortly after the SIAL trade show in France in early 1996, they developed the brand SoNice and were going to market the product Dairyworld packaged under that brand. Dusty came back from the show with the idea for a brand "Soy-Nice," which after discussions became "SoNice." At about this time an "offering memorandum" went out. When the negotiations with Dairyworld fell through (in early 1996, after IPC was formed) everything changed. Another company, named SoNice Corporation, was formed in 1996.

In Nov. 1996, IPC launched its first product, SoNice. Dusty came up with the product name. Nobody in the firm at that time was aware of the similarity between this name and that of So-Good, a very popular Australian soymilk. George had never heard of the So-Good product, and he thinks that others in IPC also had not. This launch was a momentous event for both the company and the Canadian soymilk market. A.C. Nielsen in Canada attributed the dramatic growth of the Canadian soymilk market to IPC's market entry in 1996 and 1997. Many people who tasted SoNice said it was the best-tasting soymilk on the market. Many chain stores switched brands immediately. To own the patent for the process that makes the world's best tasting soymilk was to own something very valuable–but many of the company's "financial wizards" failed to grasp this. During late 1996 and 1997 the new company grew at breakneck speed. This growth required money. The company's stock was never publicly traded, but it was almost publicly traded.

When IPC packaged SoNice in Canada, they distinguished the Canadian Package from the U.S. package by a little roundel (circular symbol), containing a maple leaf plus "Canadian Technology," on the lower right hand corner of the panel. Continued. Address: Vice-president Operations, International ProSoya Corp., 312-19292 60th

Ave., Surrey (Vancouver), BC, V3S 8E5 Canada. Phone: 604-541-8633.

1588. Conquergood, George. 1999. History of work with soyfoods and vegetarianism. Part VII (Interview). *SoyaScan Notes.* April 21. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** By now the two members of the board of directors are on their knees, begging Dairyworld Foods (the huge, billion dollar dairy products and food company in Vancouver, British Columbia–the largest in Canada) to come to their rescue. In about 1997 Dairy Foods World and Peter Joe signed a joint venture agreement, which had been under discussion and negotiation since about 1995 or 1996. As a result of that, Dairyworld Foods created a division named SoyaWorld Foods, which is a 50:50 joint venture between Dairyworld Foods and Sunrise Markets (Peter Joe, in Vancouver, the largest soymilk manufacturer in Canada). SoyaWorld, which is a marketing company for products made by the two other companies, now controls more than 60% of the non-dairy beverage market in the grocery and supermarket trade in Canada–according to A.C. Nielsen statistics. The second largest player is Beatrice (10-13%), followed by Nutrisoy (a UHT soymilk made by Nutrisoya in Quebec), then the imports (Pacific Foods, Rice Dream, Vitasoy, Westsoy, and Edensoy). SoyaWorld presently markets three soymilk products: Sunrise soymilk (a beany-flavored product made and packaged by Sunrise in plastic bottles), Soyganic (a traditional beany-flavored product made by Sunrise with organic soybeans, packaged at Dairyworld in a gable-top carton and sold refrigerated), and So-Good (licensed from Sanitarium Health Food Co. in Australia, formulated and packaged in gable-top by Dairyworld, and based on soy protein isolates). Soyganic and So-Good appeared on the shelves at about the same time in 1997 under the Soyaworld brand. They distribute those three products extensively across western Canada, and sell them in the dairy case. They are busy expanding, buying up dairies, so that they are now a national dairy, from coast to coast, in Canada. They own the shelf space in the dairy case across Canada, and they have tremendous synergies with other dairy companies in the United States. They use the dairy for distribution; SoyaWorld is really just a little marketing group. They don't want to see SoNice on the market because it outsold them 7 to 1–because it was a better product.

Now IPC is in such a mess, with so much debt (about six million Canadian dollars). Of this, about $2.5 million is unsecured to creditors. What could happen that would allow IPC to move forward? (1) A public company could buy the assets of IPC (the equipment, the brand, the goodwill)–not IPC itself; George could get rid of most of the debt with shares in a public company, so the company would not need a great deal of cash. (2) SoyaWorld could buy IPC; since August 1998 they have been trying very hard to do so. They are making a very complicated, long-term offer, with long-term royalties, etc. Both ProSoya (Raj Gupta) and IPC are tied into the deal. The amount of cash that would be put on the table at closing is quite small–not even enough to pay off the secured creditors, let alone the unsecured creditors. George is not happy with this deal, but there is not a lot he can do about it–except to keep on trying to scuttle it–as by talking to Horizon, the organic dairy. George feels very frustrated; he is cooperating with the deal to a degree, but at the same he's looking for a better deal. Yet he thinks the odds are 90% that IPC's assets will be owned by Dairyworld within the next few weeks or months. If it goes through (the closing date is May 4) George will at least get his back pay–he has not been paid since last August–but he would loose a lot as a shareholder. George does not know whether or not he has a future with SoyaWorld if the deal goes through–but he plans to be in the soy business somewhere. Since George knows more about making IPC's soymilk than any other person in the company, he is one of IPC's most valuable assets–yet SoyaWorld has not offered him a firm employment contract. SoyaWorld hopes to buy out Raj Gupta and his patents, and get him out of the picture. Continued. Address: Vice-president Operations, International ProSoya Corp., 312-19292 60th Ave., Surrey (Vancouver), BC, V3S 8E5 Canada. Phone: 604-541-8633.

1589. Sanitarium Health Food Co. 1999. Soy healthy: From the goodness of soy beans (Leaflet). Wahroonga, NSW, Australia. 2 p. April. Front and back.

• ***Summary:*** This attractive full-color leaflet is folded into 4 panels. The front shows the packages of 8 "Soy Healthy" brand vegetarian meat alternatives, nestled in a bed of lettuce and surrounded by green. Below the products: "Soy has never been so easy." The inside left panel discusses: Soy protein and phytoestrogens. Sunflower oil/Canola oil. Iron. Vitamin B-12. Fibre. The inside right panel gives detailed information on five frozen and five chilled Soy Healthy products. Frozen: Original soy burgers. Country-spiced soy burgers. Tender soy medallions. Tender soy schnitzels. Tender flaked soy fillets. Chilled: Original soy slice. Garlic & herb soy slice. Smoked soy slice. Soy sausages. Soy fillets.

The back panel lists suitability for specific diets: Reduced saturated fat / Cholesterol free. Vegetarian (lacto-ovo). No added preservatives. No added MSG. No artificial colours. For more information: www.sanitarium.com.au/Soy. Plus three toll-free numbers. From the company's "Nutrition Education Service." Address: 146 Fox Valley Rd., Wahroonga, NSW 2076, Australia.

1590. ProSoya Inc. 1999. SoyaWorld Inc. acquires So Nice soy beverage brand: Leading soy beverage company also secures a strategic interest in ProSoya Inc. (News release).

ProSoya Inc., 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. 2 p. May 17.

• ***Summary:*** "Vancouver-based SoyaWorld Inc., a leading manufacturer and marketer of fresh soy beverages, has acquired the So Nice soy beverage brand and a strategic interest in *ProSoya Inc.* Through this transaction the company has also acquired soymilk extraction plants and equipment in Ottawa and Vancouver. Terms of the acquisition were not disclosed.

"'So Nice is an organic soy beverage for health-conscious customers. SoyaWorld will re-launch the product in Canada and the United States as *So Nice Soyganic*, an organic soy beverage fortified with calcium and other essential nutrients. *So Nice Soyganic* will complement the company's successful flagship product So Good [based on soy protein isolates, licensed from Sanitarium Foods of Australia], the mainstream soy beverage and nutritional alternative to milk.

"'*So Nice Soyganic* is an organic beverage, that will be targeted to health conscious customers through distribution in the health food stores and natural food sections of major grocery stores nationwide," said Maheb Nathoo, general manager and chief executive officer of SoyaWorld Inc. 'The new *So Nice Soyganic* beverage is a natural extension of SoyaWorld's business and a quality addition to our portfolio of dairy-free beverages.'

"SoyaWorld will also assume the ownership of the licensor rights of So Nice brand for soy beverages that are currently marketed in the UK.

"SoyaWorld secures exclusive license to ProSoya soymilk technology: ProSoya Inc., an Ottawa-based soymilk technology company controlled by Dr. Raj Gupta, develops technology and equipment for production of 'non-beany' soymilk using a patented 'air-less cold grinding' process. The ProSoya technology, which provides the soy base used in the manufacture of *So Nice Soyganic*, will now be licensed exclusively to SoyaWorld Inc. in North America, with rights in certain other countries as well.

"In addition, SoyaWorld Inc. gains access to ProSoya's international patents and advanced technology used to extract soymilk from soybeans. A table top version of the ProSoya soy extraction technology was recently tested by the Johnson Space Centre and was determined to be suitable for use in soymilk production on NASA's first manned mission to Mars.

"Soy beverage industry grows: The soy beverage market is one of the fastest-growing beverage categories in Canada. Dollar volume growth for soy beverages increased 106 percent in 1998 over 1997 with Canadians consuming more than 10 million litres last year.

"SoyaWorld Inc. is jointly owned by Dairyworld Foods of Vancouver, one of Canada's leading dairies, and *Sunrise Soya Foods*, Canada's largest tofu company. Formed in 1996, SoyaWorld is Canada's largest manufacturer and marketer of dairy-free beverages, with production facilities in Vancouver, British Columbia; Brampton, and Ottawa, Ontario.

"Contact information: SoyaWorld Inc. Maheb Nathoo, general manager and chief executive officer. (604) 420-0162.

"ProSoya, Inc, Dr. Raj Gupta, President. (613) 745-9115." Address: 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. Phone: 613-745-9115.

1591. Joe, Peter. 1999. Sunrise Soya Foods and the creation of SoyaWorld Inc. in Vancouver, Canada (Interview). *SoyaScan Notes.* May 26. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** First a bit of background: In late 1995 Peter Joe went to Dairyworld and began talking with them about doing a soy yogurt together. Dairyworld is a huge co-operative of dairy farmers in western Canada (not just British Columbia). Gradually the talk turned to soymilk. Dairyworld had powerful packaging and distribution capabilities, while Sunrise had manufacturing and a deep knowledge of the soy business. Dairyworld got more and more interested in soymilk. Initially Peter started talking with a person who is no longer there. As the talks grew more serious, Maheb Nathoo was added to the team that soon drew up a shareholders and joint-venture agreement. Maheb, who is very bright, seemed to have a personal interest in soy. His daughters were into soy. He realized that milk is a commodity, that soymilk is another form of liquid protein, and is part of the milk shelf. Now he has become a convert, and he feels very strongly about the future and potential of soy. Maheb was the person who convinced the board of Dairyworld Foods (which consisted mainly of dairy farmers) that the joint venture with Sunrise was the way to go. These farmers realized that Sunrise was getting more and more space on the dairy shelf (i.e., invading their territory) so, hey, why not get involved with this newcomer. Dairy people also remember what happened with margarine; if they had gotten into the margarine business at an early date, they would have been able to offer it as another product, rather than having to compete with margarine using butter. Finally, the top executives and management people at Dairyworld think beyond the dairy farm and dairy farmer mentality, and they have done a good job over the past 3-4 years in getting the approval of the dairy farmers to go ahead with this joint venture.

At the same time Peter met Sanitarium people at trade shows for a number of years. Sanitarium was trying to sell the product into Canada from Australia in an aseptic package. Finally Peter went to Sanitarium to ask for a license; they were looking to expand internationally, so the timing was good. The final agreement gave Peter exclusive rights to sell So Good in the USA and Canada.

SoyaWorld Inc. was incorporated in Aug. 1996 with Dairyworld Foods and Sunrise each putting in money and owning half the shares. The new Soyaworld board of directors (4 people, two from each company) was formed at that time. Maheb moved from Dairyworld to SoyaWorld in late 1996. In mid-1997 Soyaworld got the license to make So Good from Sanitarium Foods (Australia). Test marketing of So Good began in mid-1997 (with the name Soyaworld Inc. on the package), then in Jan. 1998 the product was officially launched with a big TV advertising campaign. The humorous ad shows a cow confessing that she drinks So Good; it is even endorsed by cows! This may have been the first national mass market TV campaign for soymilk in North America. In late 1997 the Canadian government first allowed soymilk to be fortified with calcium and vitamins. This showed a weakening of their many laws designed to protect dairy products. Use of the word "milk" is still not allowed. Soyganic was launched in mid-1998.

Peter works closely with Dave Coe, who is the CEO and president of Dairyworld Foods and on the board of Soyaworld. He is the one who is responsible for the joint venture with Sunrise and for what is happening with Soyaworld–in a sense. Maheb is now working for Soyaworld as general manager and CEO; he no longer works for Dairyworld.

If a taste panel consisting of typical Canadians was asked to taste So Good and SoNice Vanilla, Peter thinks So Good would win. SoyaWorld plans to target So Good and SoNice to different markets. SoNice in Tetra-Pak cartons still has a very strong following among natural foods customers, but Soyaworld will try to sell SoNice in supermarkets as well as natural food stores in both fresh and UHT cartons. So supermarket consumers will have a choice. So Good is sold in both gable-top (fresh) and aseptic / UHT packages, but about 90% of the sales come from the fresh product. Peter would guess that the same would be true in the USA. Many Asian-Canadians love Soyganic, which has a beany flavor; they have grown accustomed to that taste. Address: General Manager, Sunrise Soya Foods, 729 Powell St., Vancouver, BC, V6A 1H5 Canada. Phone: 604-254-8888.

1592. Pierce, Michael. 1999. How Rolf Barthof (Prabuddha) learned to make tofu and founded Soto in Germany (Interview). *SoyaScan Notes.* June 18. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** In March 1982, Peter Wiegand started an early German tofu company named Auenland Tofu und Soja Produkte located at Hub 2, 8210 Prien-Chiemsee, West Germany. He introduced seven tofu products the day he started. Within 2-3 months after Peter started, Rolf Barthof began to stop by about once a week to help out and watch the process. He became a friend, and Peter slowly taught him how to grind the beans, make tofu (with help from others) and to clean up the shop afterwards. Michael does not know what Rolf's main occupation was in those days; he might have been a musician. When Peter opened Auenland, it was already too small for the demand, so Peter may have been hoping that Rolf would go to work for him; there was no thought of him becoming a competitor.

Before Peter's business failed, Rolph started collecting some tofu-making equipment and making small batches of tofu. Michael visited him one day–it was about one hour away by car, on the other side of the Lake Chiem (Chiemsee–the largest lake in Bavaria), located about 40 miles east southeast of Munich. On an island in the middle of that lake is Herrn Chiemsee, the beautiful castle build by King Ludwig and modeled after Versailles. After Peter's business failed, Rolf apparently got some financiers and enlarged his shop. Today he has a big, mechanized plant.

Both Michael and Peter were followers of Taka Singh, the successor of Kirpal Singh; they wore regular clothes, no robes. Rolf was a follower of Rajneesh. Address: Graphic designer, P.O. Box 238, Farmington, Georgia 30638. Phone: 706-769-0558.

1593. *SoyaScan Notes.*1999. The soy-based infant formula industry and market in the USA–Basics (Overview). June 25. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Definition: An infant formula serves as the sole source of nutrition for an infant before, and sometimes during weaning. It must supply all of the nutrients needed by an infant in precisely the right amounts, in a sanitary package. The baby's life depends on this. If the manufacturer makes a mistake, a product recall must be conducted; this is very expensive.

Because of the importance of this category of products in sustaining human life, manufacture of infant formulas is very carefully and strictly regulated by the U.S. Food and Drug Administration (FDA). The Infant Formula Act of 1980, which is the basis of that regulation, imposed new quality control and labeling requirements for infant formulas.

Of the many food and beverage categories, the manufacture of non-dairy (usually soy-based) infant formulas is the most technologically sophisticated. It is the food equivalent of building missile defense systems.

Because of the ever-present possibility of recalls, it also contains the most expensive risks of any sector of the food business. To protect themselves from these risks, all manufacturers buy product liability insurance, which is very expensive.

The only companies that have survived in this industry and those which are willing and able to take these risks. The players and competitors are some of the most powerful and experienced companies in America today, coming mainly from the pharmaceutical and food industries.

The future of soy-based infant formulas is–as of mid-1999–quite uncertain because of concern by pediatricians and toxicologists about the levels of isoflavones and phytoestrogens found in such infant formulas. On a body weight basis, the level is about the same as that contained in a birth control pill used by an adult woman.

Because of the complex and demanding nature of this industry, a number of companies have sold their businesses or simply stopped manufacturing soy-based infant formulas, as follows:

The first major U.S. company to get out of the non-dairy infant formula business was the Pharmaceutical Products Division of Borden Inc., a major American dairy company. Borden got into this industry in 1967 by purchasing Neo-Mull-Soy from Dr. Julius Muller M.D., who had launched the product in 1936. Borden had its headquarters at 350 Madison Ave., New York, New York, and its plant at Elgin, Illinois. Borden decided to get out four years later, when they sold their infant formula business to Syntex, a Palo Alto pharmaceutical company.

In 1940 International Nutrition Laboratories in Mt. Vernon, Ohio (owned and operated by Dr. Harry W. Miller, M.D.) introduced SoyaLac, a powdered infant formula based on soymilk. In 1951 he sold the company at book value to Loma Linda Foods (owned by the Seventh-day Adventist Church) of Riverside, California. In 1989 Loma Linda sold the infant formula part of its business to Nutricia, a Netherlands-based manufacturer of infant formulas, and the second largest manufacturer of such formulas in Europe after Nestle. In late 1990 Nutricia shut down the plant in Riverside and in 1994 sold all their infant formula operations Nestle/Carnation. The Soyalac brand disappeared from the market–forever. The full story of "The rise and fall of Soyalac" is told in a separate record.

Syntex Laboratories was started in 1944 by Russell Marker to make progesterone. In 1971 the company bought Neo-Mull-Soy, a soy-based infant formula, from Borden. For Syntex, a high-flying pharmaceutical company with headquarters in Palo Alto, their venture into the infant formula market was a disaster. In March-April 1978 Syntex ceased adding salt (sodium chloride) to the products out of concern that the sodium levels were too high and in the belief that adequate levels of essential nutrients were provided through other ingredients contained in the formulas. The company was mistaken. In July-August 1979 Syntex learned of an illness alleged to be related to the use of Neo-Mull-Soy and Cho-Free. Within days they notified pediatricians nationwide. The company determined that the products were low in chloride and promptly convened a panel of outstanding independent experts to review the reports and recommend corrective action. Within one week of discovering the chloride deficiency, Syntex initiated a voluntary recall of all Neo-Mull-Soy and Cho-Free products. The recall was a major effort involving first-class mailings to more than 100,000 physicians and pediatric nurses, mailgrams, nationally released media statements, and personal visits by Syntex representatives to more than 26,000 stores. In total, nearly 8.5 million cans of the formulas were recalled and destroyed by Syntex. In Dec. 1979 the formulas were reformulated to assure adequate chloride levels and approved for marketing by the U.S. Food and Drug Administration. In Jan. 1980 the reformulated products were returned to market. In Dec. 1980 Syntex ceased production of infant formulas due to lack of demand. The company no longer manufactures any infant formula products.

Wyeth Corp. (later Wyeth Laboratories Inc., then Wyeth-Ayerst) entered the non-dairy infant formula business in 1952 with Soyola, a dietary supplement to infant feeding made in Pennsylvania. In 1979 they launched Nursoy, an iron-fortified soy protein infant formula, also made in Pennsylvania. In 1984 they launched Wysoy in the United Kingdom. But in the mid-1990s, sales of Wyeth's products were first devastated in New Zealand, then in Australia, and finally in the UK by growing concerns about the safety of the isoflavones found in soy-based infant formulas. In Jan. 1996 Wyeth-Ayerst reported that it was phasing out its U.S. infant formula operations. They have probably done the same in New Zealand, Australia, and the UK.

1594. *Canadian Soybean Bulletin (OSGMB, Chatham, Ontario, Canada).* 1999. Canadian soybean exports. 13(1):4. June.

• ***Summary:*** A large table shows statistics on tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1994/95 to 1997/98. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 1997/98 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Norway 159,000, United States 134,706, Japan 62,931, Portugal 58,465, Spain 34,759, Hong Kong 23,210, Belgium 20,687, and Malaysia 20,539.

1595. *Good Food News (Sanitarium Health Food Co., NSW, Australia).* 1999. So, what's new with soy? An interview with Prof. Ken Setchell. 11(2):2-3. June.

• ***Summary:*** Recommends 50 mg/day of soy isoflavones for many health benefits, but higher levels may be needed to protect against some conditions such as loss of bone.

1596. Hayes, Keri. 1999. Biosafety protocol is put on hold. *Bluebook Update (Bar Harbor, Maine)* 6(2):1, 7. April/June.
• ***Summary:*** Delegates from 174 countries gathered in Cartagena, Colombia, for 10 days of negotiations. Their goal was to establish international rules for handling, trading, and transporting living genetically modified organisms. But on Feb. 24 they suspended their talks. On one side of the debate was the "Miami Group" (USA, Canada, Australia, Argentina, Chile, and Uruguay) and on the other was all other countries, led by the European Union–which is pushing for labeling of any products that contain GE ingredients.

1597. Kikkoman Corporation. 1999. Annual report 1998. 339 Noda, Noda-shi, Chiba 278, Japan. 30 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 1999. Contents: Financial highlights. A message from the president (Yuzaburo Mogi): The year in review, dining pleasure and convenience, serving a global market, a source of variety, seeking new growth opportunities, promoting food culture. Global operations: The Americas, Europe, Asia and Oceania, Japan. Review of operations: Soy sauce, soy sauce derivative products, Del Monte, sake and wine. Research & development. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to October 1998). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

Net sales were up slightly (7.1%), but net income was down for the second year in a row. Overseas sales (excluding exports from Japan) grew 15.8%, and have grown dramatically each year since 1994 (p. 16). In 1994 overseas sales accounted for about 15% of consolidated net sales; in 1998 about 28%. And operating income generated overseas accounted for 51% of Kikkoman's consolidated operating income.

In 1998 Kikkoman released *Akadare-to-Kurodare,* a steak dipping sauce based on a blend of their popular Akadare (miso based) and Kurodare (soy sauce based) dipping sauces.

"Serving a global market: In June 1998, Kikkoman Foods, Inc., our first overseas plant, celebrated 25 years of operation, thus marking a major milestone for our international activities. Over the past quarter century, the production capacity of the Kikkoman Foods plant–located in Wisconsin–has expanded more than tenfold. To further augment capacity, in October we commenced operations at our second plant in the United States, in Folsom, California, which is conveniently located near large markets on the West Coast. Similarly, in Europe, we raised the annual production capacity of our plant in the Netherlands to 5,000 kiloliters. Following these additions, total production of soy sauce and its derivative products at our overseas plants surpassed 100,000 kiloliters in 1998. This is approximately the same as the production capacity of the second largest soy sauce manufacturer in Japan."

Kikkoman's share of the soy sauce market in Japan is almost 3 times as large as that of its nearest competitor.

The Americas: On 6 Oct. 1998 Kikkoman had the formal opening of its second U.S. soy sauce manufacturing plant in Folsom, California. The 210,000 square meter facility was built at a cost of US$46 million and has an initial soy sauce production capacity of 10,000 liters per year. The plant began operating in April 1998 and shipments of soy sauce started in October. The Kikkoman plant in Walworth, Wisconsin, is now approaching its annual soy sauce production capacity of 80,000 kiloliters.

Color photos show: Yuzaburo Mogi (president and CEO). The opening ceremony and an outside view of the plant in Folsom, California. Most of the company's products (p. 8-13). Address: Noda, Japan.

1598. Nordquist, Ted. 1999. Soymilk in America–past and future: The soymilk wars are heating up. Part I (Interview). *SoyaScan Notes.* Aug. 10. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** After SoyaWorld was created in Vancouver (BC, Canada), because ProSoya was developing soymilk in Vancouver, they needed a quick way to get soymilk on the market. So they started negotiating with Ted to see if he could start sending soybase up to Vancouver from California. Then Sanitarium Foods (from Australia) came into the picture and threw a lot of money towards SoyaWorld, encouraging them to purchase a license to make So Good using soy protein isolates. This would also be Sanitarium's entry into the USA and North America. SoyaWorld took this approach and because of Dairyworld Foods' excellent distribution system, So Good has done very well in Canada. Their aim is to work down into the United States; they have been trying to negotiate with Suiza Foods Corp., but Suiza has its own ideas. Ted has heard that Sanitarium is involved in a lawsuit over its So Good soymilk, perhaps with SoyaWorld, because they believe that SoNice is an infraction on the name of their So Good product–SoNice and So Good are too close.

Soy is really getting into the mainstream now. Ted's company has done a lot of market studies in supermarkets and the presence of soymilk is "essentially zero." The big change will take place over the next year as soymilk starts to enter the dairy case of supermarkets. Ted is aware that Horizon has its eyes on this market. SoyaWorld is powerful, but they are up against Dean Foods, Suiza, and others. Wait until November or December of this year to see what is going to happen. Ted may be part of the action or he may get squashed–like the bug under your carpet.

Ted learned a lesson when he was making Silk for White Wave; they came out with a different product, and it didn't seem to matter much to consumers that it wasn't as good, as long as it was approximately as good. Money, labeling, distribution, networking, etc. determine the success of a product. Ted designed Silk with a very low solids content (4% solids) for very specific reasons. The main reason was money–so the product could be sold at a competitive price. But with the FDA health claim anticipated, Imagine Foods now has 7 grams of protein per serving, and White Wave's Silk soymilk has 5-6 grams of protein. You cannot use the health claim if a product contains 6.25 grams of protein per serving, because that is rounded down to 6 grams on the label. So you must have a label that states 7 grams of protein. As the solids content of a soymilk rises, any beany flavor is harder to mask, so the flavor of the soybase becomes more important, and the formulation less important. And the flavor of the soybase becomes even more important with soy yogurt, and even more important with soy ice cream–because both have higher solids content. So, if one were rational and logical, the trend toward higher solids would give Ted an advantage. Ted disagrees strongly with Steve Demos who thinks that the soybase and the formulation are of about equal importance in determining the flavor of the final product. Ted believes that the soybase contributes about 80% of the final flavor and the formulation about 20%. Steve's Silk soymilk is now made by SunRich, in Minnesota. The only other companies that make what Ted considers an acceptable soybase are Pacific Foods of Oregon, and Imagine Foods.

If SunRich were using ProSoya's airless technology and if ProSoya took SunRich to court, Raj Gupta would argue that he patented his oxygen-free process in 1988. Alfa-Laval could go to ProSoya and say that they were selling a plant that made soymilk using an oxygen-free process before that patent was instigated, and they demonstrated that plant at an international conference in 1984. The process was not patented, but it was described in published literature and was well known. To get a patent, Raj Gupta had to prove that there was no prior art; thus Ted believes that the ProSoya patents are not valid. Ted and Raj planned to do a joint venture at one time, but they disagreed on many processing issues. His process is based on the *concept* of an oxygen-free grind, but it is not strictly so. Then he makes claims that you don't have to soak the beans, etc. So there are many things that the patent office has accepted in his patent that Ted believes would not stand closer scrutiny.

Ted has compared his soybase with that made by the ProSoya process; he believes that his is much better. Shurtleff says that he always assumed that the reason Ted used the ProSoya process in Vancouver to make Silk was because it was better than his own. Ted laughs and laughs. The real reason he didn't make the soybase himself was because he had no equipment or plant with which to make it.

Ted started to develop Silk using soymilk made by Pacific Foods of Oregon. Even when he was still in Sweden in the late 1980s, he began to cooperate with them in developing a soy ice cream. Ted bought soybase from all over the world to compare it with the soybase he was developing in Sweden. He ended up using Pacific Foods' aseptically packed soybase (containing only soybeans and water) as a control for his Tofu Line and Swedish Glass ice creams. So when he came to the California in the early 1990s, his goal was to make soy beverages, yogurt, and ice cream. When Ted started doing his work in Gustine, he was using Pacific Foods' soybase. They even had an agreement on the cost of the soybase, the fact that he would be buying it in tankers, etc. The first samples Ted sent to Steve Demos were made with Pacific Foods' soybase. But when the person who finally bought the product made from that soybase turned out to be Steve Demos, then Pacific Foods of Oregon backed off. They didn't want to make soybase for a competitor in the soymilk market. So Ted had to look for a new supplier, and he came into contact with ProSoya in Surrey, near Vancouver. At that time, they were just starting up their soymilk plant and they were really naive; they could make soymilk on a small restaurant scale, but they knew almost nothing about making soymilk on a large commercial scale in a continuous process. It was a nightmare for them at the beginning. Ted did not help them with their process; he just sent them orders, which forced them to get their act together because Ted needed to buy 6,000 gallons (one tanker full) at a time. As ProSoya was learning, Ted was starting to building his own plant, but he couldn't do that until he had money, and his money would have to come from sale of ProSoya soybase to Steve Demos. So Ted went to ProSoya, not because they made better soymilk but because he didn't have the money to do it any other way. Continued. Address: TAN Industries, Inc., 49 Stevenson St., Suite 1075, San Francisco, California 94105-2975; 660 Vischer Ct., Sonoma, CA 95476. Phone: 415-495-2870.

1599. Carmack, Robert. 1999. Soy sauce. *Australian Gourmet Traveller.* Aug. p. 78-83.
• ***Summary:*** Gives brief descriptions of the following types of soy sauce: Thick soy sauce, dark soy sauce, light or thin soy sauce, low-salt soy sauce, koikuchi, usukuchi, saishikomi, marudaizu, shiroshoyu [shiro shoyu], tamari. Most recipes contain meat. Address: Australia.

1600. *SoyaScan Notes.* 1999. Novagen and the Novagen patent (Overview). Sept. 9. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Novagen is an Australian company. Novagene is an isoflavone extracted from red clover; it is the subject

of a patent application that is pending; it has not yet been issued. It was applied for in about 11 months earlier than U.S. Patent issued to Gorbach, Golden, and Adlercreutz, assignors to Tufts University. Both are concerned with treating menopausal symptoms with isoflavones. The Novagen patent is for isoflavones extracted from red clover, but they are named as genistein, daidzein, etc. Novagen has a U.S. company in Stamford, Connecticut, that sells a product made from isoflavones derived from red clover. Novagen has licensed its rights under the patent application to Protein Technologies International, now owned by DuPont, for any soy-derived isoflavones, even though the patent doesn't make a distinction between the source of the isoflavones–they just split it up by source material. PTI basically bought the rights to make a claim–even though the patent has not been issued. Some industry observers think there will be a fight between Tufts University and Novagen over these patents. Novagen could theoretically win, because there applied earlier, but under U.S. law, the first to be issued the patent has the rights; most countries assign the rights to the inventor who first applies for the patent. Thus, filing date dictates in almost every country except the USA. Since Novagen is a foreign applicant, our laws do not allow them to go back further than the application filing date, but the Tufts people can go back to records before they applied for the patent.

Why wasn't the Novagen patent ever issued? The examiners of the Tufts patent should have noted that it was prior art, but they didn't.

Update: 1999. Sept. 26. According to Mark Messina, Novagen has been in the news quite a bit recently. Two studies were recently published looking at the effect of Promensil on hot flashes. Both studies showed no effect, yet Novagen still promotes Promensil as effective in relieving hot flashes. That precipitated an editorial in the journal in which the articles were published. In both the Promensil group and the control group, urinary daidzein levels were correlated with a reduction in hot flashes–which means nothing.

1601. Dibb, Sue; Fitzpatrick, Mike. 1999. Fórmulas infantiles a base de soya: Preocupaciones para la salud [Soy-based infant formulas: Health concerns]. *Dietistas & Nutritionistas* 4(4):6-12. Sept. [49 ref. Spa]
Address: 1. The Food Commission, 94 White Lyon St., London N1 9PF, UK; 2. PhD, P.O. Box 33-849, Takapuna, New Zealand. Phone: Fitzpatrick: 0064-9 486 8068.

1602. Froding, Joy. 1999. Key ingredient of success: Isoflavones are opening doors in the nutriceutical and food industries. *Bluebook Update (Bar Harbor, Maine)* 6(3):4-5. July/Sept.
• ***Summary:*** Schouten USA Inc. in Minneapolis, Minnesota, (a division of the Royal Schouten Group in the Netherlands) and ADM are major suppliers of soy isoflavones. Laurent Leduc, International Marketing Manager for Schouten USA, says his company was the first that saw an emerging market for isoflavones because of their health benefits. In the early 1990s a Schouten researcher perfected a unique method for capturing soy isoflavones to produce a 100% natural concentrate. Introduced in 1995 to the vitamin and supplement industry, SoyLife was the first product of its type. Schouten sells two different soy isoflavone products, each with a different concentration: SoyLife 25 (containing 3% isoflavones) and the more potent SoyLife 150 (containing 15% isoflavones). The latter product is presently used in about 300 supplement applications in Europe, North America, Asia, and Australia.

In Sept. 1998 ADM introduced NovaSoy isoflavone concentrate. It is made by washing soybean flakes with alcohol to give soy molasses and soy protein concentrate. The isoflavones are then extracted from the soy molasses. NovaSoy contains 40% isoflavones with the same proportions of genistein, daidzein, and glycitein as found in soybeans or soyfoods like tofu. A photo shows a bottle of NovaSoy soy isoflavones (30 tablets).

1603. Royal New Zealand College of General Practitioners. 1999. GPs call for caution on soy milk for infants (News release). 88 The Terrace, P.O. Box 10 440, Wellington, New Zealand. 2 p. Nov. 3.
• ***Summary:*** "New Zealand's General Practitioners have joined the British Food Commission, and American nutrition foundation [named] the Weston A. Price Foundation in cautioning against the use of soy milk as an infant food 'other than in very exceptional circumstances'.

"'While the Ministry of Health is correct when it says that soy milk provides a useful alternative for babies who cannot tolerate dairy-based infant formulas, what they don't emphasise is that this represents a very small number of infants,' explained Royal NZ College of General Practitioners Chairperson Dr. Ralph Wiles.

"'The debate on dairy milk formula vs. soy milk also risks drawing attention from the best sustenance of all–breast milk,' he pointed out. 'Society as a whole needs to do much more to practically support women's choice to breastfeed, with everything from trained facilitators to a campaign promoting breastfeeding as a healthy, natural activity. That anyone can still object–as from time to time we read of them doing–to a woman discreetly breastfeeding a baby in a public area is unbelievable.'" Address: Wellington, New Zealand. Phone: 071 628 7774.

1604. Elwell, Christian. 1999. Chronology of South River Miso Co. Part III. 1983-1999 (Interview). *SoyaScan Notes.* Dec. 16. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Continued: 1983 spring–The miso company sends out a very interesting and poetic hand-lettered, dated leaflet and price list. The front panel, with a logo of three waves in a circle, announces the availability of three kinds of miso: Mellow Barley (6 weeks), Mellow Brown Rice (6 weeks), and Mellow Flint Corn (8 weeks). "South River Farm is the coming together of three families seeking common livelihood." A pie chart shows the company's costs.

1983 summer–The first in-depth story about the miso company, with five good photos, appears in *Soyfoods* magazine. The article states that the company (whose name is incorrectly given as "South River Farm Miso Company") is owned by three families, and the names of the six owners are given. Actually, however, Christian and Gaella were (and have always been) the company's only legal owners.

1983 fall–The community idea fails after one miso season (1982-83). The Wheelers leave first. Anpetu and Hannah leave in the fall of 1983; Anpetu writes a sad poem about falling leaves as they part. It takes the Elwells 10 years to repay the money the other two families had invested.

1983 Sept.–Christian goes to Charlie Kendall, who lives nearby, and asks if he can supply Charlie with rice koji for the amazake he makes. Charlie had been buying all his rice koji, dried and in bulk, from Miyako Oriental Foods in California. Christian offered to match Miyako's price and make the koji from organic rice. Christian was already making rice koji for his red miso and he needed more customers. After making many trial batches and building a koji dryer, Christian begins supplying Charlie with 900 pounds (three 300-lb batches) of koji at a time. Also that second miso season (1983-84) the first apprentice, Sonia Schloeman, works at the miso shop; Christian needs help and Sonia needs a place to stay. He pays her a salary and she stays in the loft above the shop. After Sonia leaves, the Elwells move into the loft above the shop. The second intern was Dan Hornack, who came all the way from Aspen, Colorado. From then on the arrangement was room (in the cabins across the river) and board plus a small stipend in exchange for the apprenticeship. Other apprentices who worked in the shop over the years have included (in chronological order) Rich Sweitzer and Susan Gribbon (later to marry), Michelle Gemme (Montreal, Canada), Don Phillips, Michael Dessen, Tim Langdon, John and Mary Granger, Caroline Wurts, Maggie Smith, Andrew Goodman, Tolly Gibbons (New Zealand), Anne Walsh Sullivan, Bobby (age 18 and white, from South Africa), Sean LePoutre, Maria Low, Kamil Bersky (a medical doctor from the Czech Republic), and Stephen Jannetta. Stephen worked at the shop for two seasons (Oct. 1990 to May 1991, and Sept. 1993 to May 1994), then helped others (Soyalab, and La Fonte della Vita) to start commercial miso production in Italy. His brother, Phil Jannetta, worked for Mitoku in Tokyo. Most apprentices stayed for one full miso season. Gaella cooked for everyone.

1983 Oct. 17–Isaiah, the Elwell's second child is born.

1983 Nov.–The company runs its first ad (1/3 page vertical) in *East West Journal*. The theme: "Wisely given miso gives its own wisdom." An illustration at the bottom shows the miso shop buildings. A logo at the top shows three waves in a circle.

1985–Starting this year, a group of students from the Kushi Institute at Becket, Massachusetts (which is about 1½ hours drive away) comes to visit to miso shop–even though Christian has had no personal connection with the macrobiotic movement for many years. Over the years, the number of groups has increased to 3-4 a year. In the early years, Christian would give a slide show and talk on miso-making. Now they usually come on a weekend and take a tour of the shop when it is not in production, and Christian will share with them what he has learned about miso.

1989-90–The Elwells, with the help of Fred Hubbard, design and begin building a timber-frame home located behind the miso shop–about 12 feet away from it. For the previous 5 years they had lived in the loft above the miso shop. Fred eventually built his own home in Conway, where he now resides as a carpenter and builder.

1991-92–The Elwells stop taking apprentices and start with paid workers. There was a difficult period of transition as Christian began to tire of working in the shop. Workers include Larry Glanz, a former student who worked with Muramoto-sensei and Stephen Jannetta.

1995 Aug.–Christian seriously considers selling his miso company to Barry Evans, owner of American Miso Co. and Great Eastern Sun in North Carolina. He had taken training to become a Waldorf School teacher. But this would require the Elwells to give up their land, and although it was quite isolated, they did not want to leave it.

1995 fall–Yukio Doyama begins to work at the miso company, a happy, hard-working man who enjoys making miso. At the same time, Steve Freiman comes to live above the miso shop and work with Yukio. Christian was now freed up for an extended time from day to day production and packing work; he began taking a more supervisory role and handled most of the office work and shipping. Andy Mathey followed in Steve Freiman's position, working with Yukio.

1996-97–This fiscal year the miso business is computerized. In late 1997 Christian decides not to sell the miso company, and to invest much more energy, time and resources in it–"to make it come alive again" after a period of hibernation. "When we clear up things inwardly, this is reflected by outward things." Quickly, all sorts of good new things begin to happen.

1998 Feb.–The first issue of *River Currents: News from South River Miso Company* is published. This attractive newsletter contains a catalog and order form, plus news about miso and the company.

1997-98 fall and winter–Three young people come to live at South River Farm to cultivate the land–and to work on forming a community. Arthur Lerner comes first, then his partner, Emily Kellert, and soon after, David Fisher. That winter these three also work part time in the miso shop. Robin Cole, a friend of many years, arrives in early spring of 1998 and creates the position of office manager/ administrative assistant.

June 1998–The Elwells and coworkers finalize a mission statement for the miso company after three months of weekly meetings. It is published in the winter (Dec.) 1998 issue of *River Currents*.

1999 Sept.–The apprenticeship program is reinstated; Maria Rossi is the first to fill the position.

1999 Dec. 16–Christian says that the miso company, about to enter its 21st year or adulthood, is taking on a life of its own. Gaella was never a regular miso maker in the shop. In the early years she was a full-time mother and cooked hundreds of meals for builders and then miso apprentices. Her role has always been one of moral support. This year she does work in the shop two afternoons a week on the packing crew. The many new people are contributing to the growth of the miso company as a "learning organization" (see *Fifth Discipline*, by Peter Senge).

South River Farm is now moving in the direction of being home to self-sustaining farmstead–"as the place in which South River Miso is planted." David Fisher has built a pole barn, gotten draft horses, pays a modest lease, and sells his organic produce. Address: Founder and Owner, South River Miso Co., South River Farm, Conway, Massachusetts 01341. Phone: (413) 369-4057.

1605. Hymowitz, Ted. 1999. Soybean farmers in Illinois have been hurt financially by their rush to grow Roundup Ready soybeans (Interview). *SoyaScan Notes*. Dec. 26. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Traditionally farmers have been quite conservative when it comes to making changes in tried and true agricultural practices. But over the past few years they have rapidly embraced genetically engineered soybeans and other crops. The big biotech companies, in their zeal for profits, have hurt many farmers.

In central Illinois, the prices of all herbicides have dropped because of Roundup and Roundup-Ready seeds. These farmers don't need to pay a big biotechnology fee when they buy soybeans. They can use regular soybeans and regular herbicides. But they don't want to. They read all these farmer testimonials then uncritically buy Roundup-Ready seeds. This is unnecessary in Illinois; it may be cost effective in southern states like Arkansas and Tennessee where weeds are more of a problem, but not in the Midwest. The same is true of Bt seeds. This is one reason many farmers are losing money these days. Then they scream for the U.S. government to bail them out. It's poor decision-making. The farmers, themselves, are to blame. And farm magazines like *Soybean Digest* are basically "in bed" with the biotech companies; they should be representing the farmers.

Ted has seen two studies (from Wisconsin and from Iowa) that compare yields and profits from conventional and Roundup Ready soybeans. They showed little or no difference in yield or profit. Farmers do not really use less herbicides on Roundup Ready soybeans than on conventional ones; that's a myth. Moreover Roundup does not kill all the weeds in a field; some survive because they evade the spray–not because of their species or the development of resistance–although two weed species in Australia are reported to have developed resistance. Moreover, Roundup does not kill other pests that attack soybeans such as nematodes, molds, etc. Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1606. Samman, S.; Lyons Wall, P.M.; Chan, G.S.; Smith, S.J.; Petocz, P. 1999. The effect of supplementation with isoflavones on plasma lipids and oxidisability of low density lipoprotein in premenopausal women. *Atherosclerosis* 147(2):277-83. Dec. *
Address: Human Nutrition Unit, Dep. of Biochemistry, Univ. of Sydney, Sydney, Australia.

1607. Sanitarium Health Food Company. 1999. Sanitarium (Portfolio). Berkeley Vale, NSW, Australia. 27 inserts. 30 cm.

• ***Summary:*** This is simply a collection of colorful documents (each in full color) without a portfolio cover, sent with a cover letter by Melissa Harris, Nutritionist. The documents include: (1) Eight nutrition fact sheets. Subjects include wholegrains, fibre, heart health, etc. (2) Seven product sell-sheets, incl. SoyHealthy, So Good Now, Soyaccino, etc. (3) Three small recipe booklets. (4) 10 tips for healthy eating for the family. (5) Now there's an easy way to lower your cholesterol. (6) Six food cards with recipes. (7) Two booklets in "A taste for health" series. (8) List of available publications and videos.

(9) Sanitarium product range–Australia: Cereals (19 products, incl. Soy Tasty, Weet-Bix Hi Bran Soy & Linseed, Up & Go). Beverages (6 products, all based on So Good, incl. yoghurts and ice cream). Meals (19 products, incl. 5 types of Soy Healthy Frozen, 9 types of Soy Healthy Chilled, Soya Beans in Tomato Sauce, Sanitarium Soya Mince/TVP, BBQ Soya Sausages). Spreads (4 products incl. Marmite and many types of peanut butter). Specialty Foods (incl. many nuts & seeds, dried fruits, legumes, pulses & seeds, fruit snacks, and juices). (10) Leaflet (1999; color, front and back) titled "Soya beans, good health & you."

Contents: Introduction. What are phytoestrogens. Protecting hearts. Combatting cancer. Managing menopause. Promoting healthy bones. Soy foods for children. Putting the good news into practice. Address: 1 Sanitarium Drive, Berkeley Vale, NSW 2261, Australia. Phone: (02) 4348 7777.

1608. **Product Name:** Soyco Tofu [Hi-Protein Firm].
Manufacturer's Name: Soyco Soyfood Product [Nutrisoy Pty. Ltd.].
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia. Phone: 02-9695-7755.
Date of Introduction: 1999. December.
Ingredients: Organic soybean, water, natural coagulant (magnesium chloride).
Wt/Vol., Packaging, Price: 750 gm.
How Stored: Refrigerated.
New Product–Documentation: Label with date sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in December 1999. Red, green, orange, yellow and black on pale white.

1609. **Product Name:** Tonzu Organic Tofu [Teriyaki].
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 1999.
Ingredients: Certified organic soybeans (guaranteed to be non-genetically modified), filtered water, natural coagulant nigari (511). Teriyaki flavour sachet: Fermented soy beans, sea salt, cider vinegar, honey, ginger, garlic.
Wt/Vol., Packaging, Price: 275 gm, vacuum packed inside paperboard box.
How Stored: Refrigerate at 4°C or less.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 1996, but it was first sold in this paperboard box in 2001. They started using the Tonzu brand name in 2002. Color photo of snowy mountains beyond a deep green valley, on deep blue background. Superb label design. GE [Genetically Engineered] Free logo. Certified Organic logo.

1610. **Product Name:** Tonzu Organic Tempeh.
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 1999.
Ingredients: Certified organic whole soybeans. Rhizopus culture.
Wt/Vol., Packaging, Price: 250 gm, vacuum packed inside paperboard box.
How Stored: Refrigerate at 4°C or less.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 1999, but it was first sold in this paperboard box in 2006. They started using the Tonzu brand name in 2002. 5.75 by 4.75 by 1 inch. Color photo of snowy mountains beyond a deep green valley, on a bamboo green background. Superb label design. Certified Organic logo. On side panel: "Tempeh is a traditional high protein Indonesian soy food and one of the few vegetarian sources of vitamin B12. It is an excellent alternative to red meat, chicken, eggs or fish... Consume within 24 hours once opened. Can be frozen."

Letter (e-mail) from Elizabeth Chalmers. 2007. Jan. 22. "Today, after incubation in perforated plastic bags, we cool the tempeh down to 4°C, vacuum pack it, then pasteurize / blanch it in boiling water in the cooker for 15 minutes. We have had a few problems with shelf life. Tempeh can blow up like a football on the chiller shelf in and even on occasion has jumped off the shelf–tempeh with an attitude! We are a bit puzzled as to why the occasional packet does this."

1611. Okura Boeki-cho (Ministry of Finance, Division of Trade). 1999. Miso yûshutsu tsûkan jisseki–Heisei 10 nen [Japan miso exports worldwide in 1998]. Tokyo, Japan. 1 p. [1 ref. Jap]
• ***Summary:*** This 1-page table, written in Japanese, gives the exports of miso to various countries, in calendar year 1998, by region. We will list them here in descending order of volume by region–in kilograms. Asia: Taiwan 349,591. Hong Kong 332,325. Korea 232,115. Singapore 120,681. Thailand 100,459. Philippines 44,605. Malaysia 40,129. Indonesia 26,585. China 23,024.

Middle East: United Arab Emirates *(Arabu)* 9,895. Israel 4,887. Kuwait 1,256.

Europe (Western and Eastern): Netherlands 115,703. Germany 102,724. England 74,231. France 45,971 Sweden 40,170. Italy 20,283. Belgium 17,932. Austria 13,370. Spain 6,118. Denmark 4,090. Canary Islands (Spain) 2,000. Russia 1,715. Finland 1,310. Switzerland 450.

North America: United States: 2,297,893. Canada 242,240.

Latin America: Argentina 12,589. Brazil 12,338. Costa Rica 400.

Africa: South Africa 2,678.

Oceania: Australia 164,601. Guam 31,553. New Zealand 27,621. Mariana Islands 6,578 (of which the largest is Guam). Palau Islands 650.

Note: This is the earliest document seen (March 2010) concerning soybean products (miso) in Palau; soybeans as such have not yet been reported.

Total exports. 4,531,300 kg. Total amount of miso made in Japan in 1998: 548,750,000 kg. Percent of miso made that is exported: 0.82%. Address: Japan.

1612. Ashton, E.; Ball, M. 2000. Effects of soy as tofu *vs* meat on lipoprotein concentrations. ***European J. of Clinical Nutrition*** 54(1):14-19. Jan. [53 ref]
Address: School of Biological Sciences, Deakin Univ., Victoria, Australia.

1613. Fitzpatrick, Mike. 2000. Soy formulas and the effects of isoflavones on the thyroid (Editorial). *New Zealand Medical Journal* 113(1103):24-26. Feb. 11. [42 ref]
• ***Summary:*** Contents: Introduction (In Nov. 1998) the New Zealand Ministry of Health (MOH) issued an update on its position on soy formulas. The goitrogenic effect of soy. Isoflavones: the goitrogenic agents in soy. Isoflavones: levels of dietary exposure. Isoflavones: the risks to consumers. Conclusion. Address: Kingett, Mitchell & Associates, Auckland, New Zealand.

1614. Roberts, Patricia. 2000. History of interest in macrobiotics. Living on the Oak Feed Miso Co. land in Rutherfordton, North Carolina from 1979 to 1980. Part III (Interview). *SoyaScan Notes.* May 20. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** 1983 Feb.–Patricia leaves Joseph and moves away from North Carolina, to California.

1983–In California, she lived for eight years in Marin County, where she was a disciple of Bubba / Da Free John, an American-born spiritual teacher who had a community at Clear Lake. These were the best years of her life. Da Free John lived for a while on an island in Fiji and now he lives on one of the San Juan islands off the coast of Seattle, Washington. 1993–Patricia moved back to Boca Raton, Florida, to be near her family; there she ran an antique shop for 7 years. After returning to Florida, Patricia really wanted to call Sandy–but she couldn't; it was just too difficult.

1997 Nov. (late)–Patricia accidentally bumps into Sandy at a Heat basketball game in Florida. Sandy phoned her later that night, because he was so excited to see her again, asked why she had not called him–he had always really loved her. She said, "Because I have been so angry with you all these years." He said, "What about?" He did not know, so she told him a little bit about why she was still upset–but she did not hold anything over his head. He got it. On many nights thereafter they talked on the phone for hours. But they did not get together until early 1998, when they started dating. At her birthday dinner, on 28 March 1998, Sandy told her (she remembers this very clearly, as he sat across the table) that he had called John Belleme and that John had said Patricia was right–that Patricia and Joseph had been asked to leave, that they had been "screwed" (i.e. treated very unfairly), and still had not been paid the money they were owed. It wasn't clean. Patricia was happy to hear that John's recollection was the same as hers. Patricia and Sandy got involved with one another again, and Patricia recalls clearly that Sandy said something like "Stick with me, baby, and I'll be sure you get the money back." Again she believed he would rectify the unfair situation. Sandy said he was shocked at how much John remembered about how Patricia and Joseph had been treated unfairly.

Patricia again ended her relationship with Sandy on a bad note." He is the only person with whom she still has a bad relationship.

For the last eight years Patricia has lived in Boca Raton, where she ran an antique shop. Recently she moved to Grass Valley, California, to be near her children.

Sometimes Patricia sits down with her journal and reviews her whole life: she feels as if events fall into decades, and how quickly time passes. She continues to have a strong interest in meditation, yoga, and vegetarianism. She no longer practices macrobiotics, but she has been strongly influenced by it and she loves brown rice and some other macrobiotic foods. She is now feeling an urge to start teaching cooking classes again; she enjoys it very much and is very good at it. Address: Grass Valley, California.

1615. Fallon, Sally W.; Enig, Mary G. 2000. Tragedy and hype: The Third International Soy Symposium. *Nexus (New Zealand).* April/May. p. 15-20, 69.
• ***Summary:*** Contents: Introduction. Marketing the 'perfect food.' Cinderella's dark side. Soy protein isolate: Not so friendly. FDA health claim challenged. Soy consumption and cancer. Phytoestrogens: Panacea or poison? Birth control pills for babies. Dissension in the ranks (Dr. Lon White of Hawaii on soy and Alzheimer's). Questions over GRAS status. The next asbestos?

The authors are highly critical of soyfoods. This 4-day [actually 2-day] symposium took place in Washington, DC, in Nov. 1999 [Nov. 12-13]. Several weeks earlier, on Oct. 25, the U.S. Food and Drug Administration announced a health claim for soy products which were low in saturated fat and cholesterol and 6.25 gm of soy protein per serving. Among the surprising statements in this article: Isolated soy protein is made from what was once considered a waste product–the defatted, high protein soy chips–which look and smell terrible. "Flavourings, preservatives, sweeteners, emulsifiers and synthetic nutrients have turned soy protein isolate, the food processors' ugly duckling, into a New Age Cinderella" (p. 15).

"The propaganda that has created the soy sales miracle is all the more remarkable because, only a few decades ago, the soybean was considered unfit to eat–even in Asia." Note: In the 1970s there were approximately 30,000 tofu manufacturers in Japan alone, plus many more in China, Korea, and Indonesia.

Note: No references appear with the printed version of this article, but 72 references are found with the article on the authors' website. Address: 1. M.A.; 2. PhD. Phone: 619-574-7763.

1616. Simons, L.A.; von Konigsmark, M.; Simons, J.; Celermajer, D.S. 2000. Phytoestrogens do not influence lipoprotein levels or endothelial function in healthy, postmenopausal women. *American J. of Cardiology* 85(11):1297-301. June 1. *

1617. Kikkoman Corporation. 2000. Annual report 1999. 339 Noda, Noda-shi, Chiba 278, Japan. 33 p. 28 cm. [Eng]
• ***Summary:*** The information in this English-language annual report is current as of April 2000. Contents: Financial highlights. A message from the president (Yuzaburo Mogi): Overview of the fiscal year, principal developments, summary of business policy (business principles, medium-term business strategy, business organization, basic policy on distribution of profits, looking to the future, tasks for the coming years, in closing). Global operations: The Americas, Europe, Asia and Oceania, Japan. Review of operations: Soy sauce, soy sauce derivative products, Del Monte, sake and wine. Research & development. Financial section: Consolidated balance sheets, etc. Corporate history (chronology from April 1925 to Nov. 1999). Global network (directory of Kikkoman names, addresses, and phone numbers worldwide). Board of directors and officers. Corporate data.

Consolidated net sales fell 3.4%, but net income rose 1.3%. In 1999 overseas operations (excluding exports from Japan) accounted for about 27% of consolidated net sales and 49% of Kikkoman's consolidated operating income.

The Americas: Today more than 100 items are manufactured at Kikkoman's plant in Walworth, Wisconsin. The plant's annual soy sauce production capacity is 80,000 kiloliters. The new Folsom plant had an initial annual soy sauce production capacity of 10,000 kiloliters. There is room to expand this capacity fourfold. In the year 2000 production capacity is expected to reach 15,000 kiloliters. Annual per capita soy sauce consumption in the USA has increased to 700 milliliters, which is less than 8% of the estimated 9,000 milliliters per capita in Japan. U.S. consumption is expected to double within the next ten years.

Color photos show: Yuzaburo Mogi, Kikkoman's new headquarters in Noda, all company products. Address: Noda, Japan.

1618. Leatherhead Food Research Assoc. 2000. Functional food markets, innovation and prospects. Leatherhead, Surrey, England. June. 30 cm. *
• ***Summary:*** This market study, No. R181-034, retails for $1,193. Probiotic dairy products dominate the European and Australian markets for functional foods. The four major types of functional food products are targeted at gut health, heart health, immune function, and bone health. Address: Randalls Road, Leatherhead, Surrey KT22 7RY, England.

1619. Nordin, B.E. Christopher. 2000. Calcium requirement is a sliding scale: Perspective *American J. of Clinical Nutrition* 71(6):1381-83. June. [44 ref]
• ***Summary:*** High intake of animal protein probably increases the risk of osteoporosis because it increases urinary calcium. So the less animal protein one consumes, the less calcium one needs; it is a sliding scale. Address: Div. of Clinical Biochemistry, Inst. of Medical and Veterinary Science, Adelaide, Australia.

1620. Khaleque, Abdul. 2000. Re: Work with soymilk and soybeans in Bangladesh. Letter (fax) to William Shurtleff at Soyfoods Center, July 27. 1 p. Typed, with signature on letterhead.
• ***Summary:*** "My name is Abdul Khaleque. I carried out research on soymilk at Massey University, New Zealand in order to fulfill the requirement for the degree of Doctor of Philosophy from 1969-'71 and published a number of papers in National and International Journals.

"I worked for about 35 years in Bangladesh Council of Scientific and Industrial Research (a national research organisation) and retired as Director. After retirement, I joined as Technical Director in a big National NGO named Gonoshasthaya Kendra (GK). As the authorities of Gonoshasthaya Kendra knew me and about my work, they appointed me to implement a project on production of soymilk for commercialization. We are in a final stage of implementing the project." Address: Director (Tech.), Gonoshasthaya Kendra, Peoples Health Centre, Nayarhat, Dhaka-1344, Bangladesh. Phone: 933 22 45.

1621. Fallon, Sally W.; Enig, Mary G. 2000. Tragedy and hype: The Third International Soy Symposium. Parts I & II. *Nexus (New Zealand).* July. p. 66-71; Aug/Sept. p. 56-58. [72 ref]
• ***Summary:*** Note: This article, which is extremely critical of soy and the soy industry, is identical to that by the same authors that appeared in *Nexus* (New Zealand) in April/May 2000 except that: (1) The word "Hype" was accidentally written "Hope" in Part I of this article; (2) The references are included with the article. Address: 1. M.A.; 2. PhD. Phone: 619-574-7763.

1622. Doyle, Jeff J.; Doyle, Jane L.; Brown, A.H.D.; Pfeil, B.E. 2000. Confirmation of shared and divergent genomes in the *Glycine tabacina* polyploid complex (Leguminosae) using histone H3-D sequences. *Systematic Botany* 25(3):437-48. July/Sept. [28 ref]
• ***Summary:*** Appendix 1 contains the description of a new Australian species, *Glycine stenophita.* Address: 1-2. L.H. Bailey Hortorium, Cornell Univ., Ithaca, New York, 14850

3. CSIRO Div. of Plant Industry, Canberra, ACT 2601, Australia.

1623. *Nutrition Business Journal (San Diego, California).*2000. GeniSoy markets to an expanding demographic: Soy manufacturer introduces new products, expands distribution and secures non-GMO supplies. 5(7/8):10-11. Annual Industry Overview 2000.
• ***Summary:*** GeniSoy's parent company, MLO Products, was founded 36 years ago [in Nov. 1964] as a sports nutrition company that relied heavily on soy protein. Today its subsidiary, GeniSoy Products Co., launched only three years ago (in March 1997), accounts for about 50% of total sales–of about $40 million, to which GeniSoy contributed $18 million in FY 2000 (ended April 30). More remarkable, GeniSoy's $18 million is double what it was a year ago, and it is expected to double again next year.

MLO had traditionally marketed soy protein drinks aimed at athletes between the ages of 15 and 40. GeniSoy products are targeted to an entirely different market–those (mostly women ages 35 to 69) areas in which soy provides benefits, such as heart disease, menopause symptoms, etc. The idea come to MLO quite by accident about 5½ years ago when they were asked by another company to produce a soy protein bar for a university study on soy and cancer. After GeniSoy was launched, its products were sold mainly through MLO's established distribution channels. But soon they picked up many new distributors.

When the FDA announced its soy-heart health claim in Oct. 1999, soy became a very hot category. Many retailers began to develop a "soy set" in their stores–an area where soy products are grouped together. General Nutrition Centers (GNC), for example, are developing such a set, and GeniSoy's products tend to sell more quickly when they are placed in such a set than when they are placed with other bars.

Many consumers believe that soy products don't taste so god, but when they try GeniSoy bars they quickly change their minds and tell their friends. So bars are a great way to introduce consumer to soy.

In Feb. 1999 GeniSoy introduce their first products guaranteed to be free from genetically engineered organisms (GMOs); these included two shakes and one protein powder in the new UltraSoy line. The company says these were made more for the European than for the American market. Later in 1999 the GeniSoy secured a long-term supply contract for non-GMO isolated soy protein from Protein Technologies International, then announced in October 1999 that its entire product line would be made with non-GMO soy.

Recently MLO Products completed a new plant at its Fairfield headquarters, thus bringing its total office and manufacturing space to 125,000 feet. Its extruded candy production capacity has grown to 20 million bars/month. It plans to bring in-house its formerly contracted soynut roasting facilities with a capacity of 2 million lb/month.

Today GeniSoy has 29 SKUs in the U.S. market, 26 in Canada, and 15 in Australia. Two new products are scheduled for release next year: (1) A kind of a soy chip, between a potato chip and a mini rice cake, that will meet the FDA health claim; (2) A Soy Nutty Bar, made with toasted soy nuts, and tasting like a candy bar.

Note: This is the earliest document seen (Sept. 2000) that gives statistics for larger U.S. nutrition bar companies.

1624. James, A.T.; Bumstead, E.E.; Grant, T.J. 2000. Development of fast small-scale tests to measure tofu potential in raw beans. In: Kyoko Saio, ed. 2000. Proceedings–Third International Soybean Processing and Utilization Conference. Tokyo, Japan: Korin Publishing Co., Ltd. [xxiv] + 728 + 8 p. See p. 157-158. [1 ref] Address: CSIRO Tropical Agriculture, 120 Meiers Rd., Indooroopilly 4068, Qld, Australia.

1625. *Canadian Soybean Bulletin (OSG, Chatham, Ontario, Canada).*2000. Canadian soybean exports. 14(2):3. Nov.
• ***Summary:*** A large table shows statistics in tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1996/97 to 1999/2000. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 1999/2000 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Japan 179,708, United States 121,860, Malaysia 99,919, Indonesia 64,426, Denmark 47,444, Germany 43,410, and Netherlands 36,392.

1626. *SoyaScan Notes.*2000. Chronology of major soy-related events and trends during 2000 (Overview). Dec. 31. Compiled by William Shurtleff of Soyfoods Center.
• ***Summary:*** Jan. 8–The Kerry Group (of Wisconsin and Iowa) purchases Solnuts, a pioneer manufacturer of dry-roasted soynuts, in Hudson, Iowa.

Jan.–Kraft Foods Inc. (Illinois) purchases Boca Burger Inc., America's third largest maker of veggie burgers, after Worthington Foods and Gardenburger.

March 6–The Hain Food Group announces that it will acquire the Celestial Seasonings tea company to become the largest natural foods company in the USA.

March 9–The USDA formally approves a rule change allowing soy protein products to completely replace meat products in the Federal School Lunch Program.

March 31–Monsanto, the world's leading agricultural biotech company, merges with Pharmacia & Upjohn (a large pharmaceutical company), and the new company is renamed Pharmacia Corporation.

April–An article by Lon White on tofu and brain aging is published in *J. of the American College of Nutrition.*

June 9–20/20 (ABC) television program, titled "Soy–The untold story," airs on Friday at 10:00 p.m. discusses many of the shortcomings of soyfoods, but in a very fair way.

June 13–Martha Stewart, on her popular nationwide TV program *Living*, has a very positive segment on edamamé.

July 14–Lightlife Foods Inc. (of Turners Falls, Massachusetts) is purchased by ConAgra Inc., a $25 billion food company based in Omaha, Nebraska–for an undisclosed amount. Lightlife's plant, employees, and management team will stay in place. Lightlife is a leading maker of vegetarian meat alternatives, with 150 employees and about $25 million in annual sales.

July–At a joint meeting of ASA and USB, the International Soy Protein Program (ISPP) was born as ASA and the Illinois Soybean Program Operating Board (ISPOB) formalized their joint commitment to "Increase the international consumption of soy protein by humans in new markets–developing countries–and thereby create new opportunities for disappearance of soybeans and provide higher economic returns to U.S. soybean producers." ISPOB and its Executive Director Lyle Roberts were instrumental in conceiving the program and raising its initial funding. This program was later reamed WISHH.

Sept.–Monsanto's patent on glyphosate expires. Glyphosate is the active ingredient in *Roundup*, the world's best-selling herbicide.

Dec.–Sanitarium Foods of Australia acquires the 47% of SoyaWorld owned by Sunrise Soya Foods (Vancouver, BC, Canada).

Trends: 1. This year, the momentum created by the FDA health claim in Oct. 1999 has propelled the soyfoods industry to new heights. Existing companies are growing rapidly, and many new companies (including some of America's biggest food companies) are entering the market with new products.

2. This year, for the first time, soymilk has become a mainstream American beverage. As of May, White Wave Silk soymilk is sold in 24,000 supermarkets nationwide. Edamamé (green vegetable soybeans) have gone mainstream in California, and are rapidly becoming popular on both coasts of the USA.

3. In the United States and Europe, the tide seems to be flowing increasingly against genetic engineering of foods and food plants. More and more companies in the natural foods industry are labeling their products as "non-GMO" or "GMO-free" or "No GMOs." Monsanto has stopped its efforts to develop genetically engineered soybeans for food use and focused its attention instead on livestock feeds. It now seems likely the genetic engineering of plants has a future, but not in the area of foods–at least in developed countries.

4. Interest in "food-grade soybeans" continues to grow in the USA and has increased substantially this year. Canada began focusing on identity-preserved food-grade soybeans 10-15 years before the USA. U.S. interest began to grow in about 1995 with the introduction of genetically engineered soybeans and with the accelerating interest in food uses of soybeans.

5. While pro-soy articles (mostly about health benefits) continue to increase, so do anti-soy articles and Internet sites. The loudest anti-soy voices are those of Sally Fallon and Mary Enig of the USA (they believe traditional fermented soyfoods–such as miso, shoyu, natto, and tempeh–are good, traditional non-fermented soyfoods–such as tofu, soymilk, and edamamé–are not very good, and modern soy protein products–such as soy protein isolates, concentrates, and textured soy flour–are the worst of all, being highly processed with chemicals such as hexane solvent), Richard and Valerie James of New Zealand, and Lon White of Hawaii. Some of the concerns they raise are legitimate and deserve further research, but the majority (we believe) are not. Nevertheless, many of the health claims made for soy in popular articles are exaggerated or somewhat sensational, and not firmly supported by scientific evidence.

6. As we are about to enter a new century and a new millennium on 1 Jan. 2001, soyfoods appear to have a bright future, worldwide. This past year has seen more activity and interest in, and media coverage of, soyfoods than at any time in the history of the United States.

1627. Gupta, Raj. 2001. Changes in ownership of SoyaWorld, Inc. (Interview). *SoyaScan Notes.* March 17. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** In Dec. 2000, Saputo, a large American cheese company, acquired Dairyworld Foods (Burnaby, British Columbia, Canada) and thereby also acquired Dairyworld's 50% ownership of SoyaWorld, Inc.

Then in Jan. 2001 Sanitarium Foods of Australia bought Peter Joe's 50% ownership of SoyaWorld. Maheb Nathoo is still the managing director of SoyaWorld, and the company is doing well. Maheb is basically a financial man.

The soymilk company in Scotland, which used ProSoya technology and which Dusty Cunningham helped to start, has declared bankruptcy. Raj is now negotiating with another company to take over the plant and equipment.

Raj has heard that Dean Foods is for sale, and that White Wave's Silk is not yet profitable. Address: President and CEO, ProSoya Inc., 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. Phone: 613-745-9115.

1628. Ragone, Diane; Lorence, David H.; Flynn, Timothy. 2001. History of plant introductions to Pohnpei, Micronesia and the role of the Pohnpei Agriculture Station. *Economic Botany* 55(2):290-324. April/June. [30 ref. Eng; pol]
• ***Summary:*** Pohnpei (formerly Ponape) is located in the eastern Caroline Islands, approximately 4,800 km southwest of Honolulu. A high volcanic island with a land area of only 344 square km, it is the third largest in Micronesia (after Guam and Babeldoab) and the largest in the Caroline group. It is presently a member state and capital of the sovereign nation of the Federated States of Micronesia (FSM). The population is about 35,000, one-third of whom live in the island's main town, Kolonia.

History: Pohnpei was formerly colonized by Spain, Germany, and Japan. After World War II, the island was administered by the United Nations as a UN trusteeship (Trust Territories of the Pacific Islands). During the Japanese period (1914-1945), the Japanese Tropical Research Industries Institute was established. It became very active largely through the efforts of one man, the distinguished agronomist Moritaro Hoshino, who came to the island in 1927 and set about making Ponape the center of Japanese agricultural research in Micronesia. In the 1930s the Pohnpei station was one of the world's foremost centers for the study of tropical agriculture.

Appendix I of this article, titled "Plants documented as introduced to the Island of Pohnpei, including all plants tested or cultivated at the Pohnpei agricultural station" (p. 304+) states (p. 313) that the soybean was introduced during the Japanese period for use as a vegetable.

Note: This is the second earliest document seen (July 2002) concerning the cultivation of soybeans in Micronesia. This document contains the earliest date seen for soybeans in Micronesia, or the cultivation of soybeans in Micronesia (1945 or before). The source of these soybeans was probably Japan. Address: National Tropical Botanical Garden, 3530 Papalina Road, Kalaheo, Hawaii 96741.

1629. Teede, Helena J.; Dalais, F.S.; Kotsopoulos, D.; Liang, Y.-L.; Davis, S.; McGrath, B.P. 2001. Dietary soy has both beneficial and potentially adverse cardiovascular effects: A placebo-controlled study in men and postmenopausal women. *J. of Clinical Endocrinology and Metabolism* 86(7):3053-60. July. [50 ref]
Address: 1, 3-4. Cardiovascular Research Group, Dep. of Medicine, Monash University, Clayton, Australia.

1630. Shanmugasundaram, S. 2001. Global extension and diversification of fresh and frozen vegetable soybean. In: T. Lumpkin, ed. 2001. Second International Vegetable Soybean Conference. Pullman, Washington: Washington State University. 202 p. See p. 161-165. [9 ref]
• ***Summary:*** Contents: Introduction. Extension of vegetable soybean. Diversification of fresh and frozen vegetable soybean. Conclusions. Acknowledgement.

World maps show: (1) Progress in evaluation and release of AVRDC vegetable soybean from 1979 to 1983. Countries include England, France, Niger, Nigeria, Pakistan, India, Thailand, Malaysia, Indonesia, Philippines, Taiwan, Japan, and Korea. (2) AVRDC vegetable soybean evaluation, commercial production and export as of 2000. Countries include England, Germany, France, Italy, Ukraine, Ghana, Nigeria, Congo [formerly Zaire], Zambia, Namibia, Lesotho, Swaziland, Zimbabwe, Mauritius, Malawi, Tanzania, Kenya, Uganda, Saudi Arabia, Pakistan, Bhutan, Bangladesh, India, Nepal, Thailand, Cambodia, Sri Lanka, Malaysia, Singapore, Indonesia, Australia, Fiji, Solomon Islands, Papua New Guinea, Marshall Islands, Guam, Philippines, Laos, Vietnam, Taiwan, China, Korea, USA, Guatemala, El Salvador, Nicaragua, Costa Rica, Panama, Ecuador, Argentina, Chile, Brazil, Suriname, Guyana, West Indies, Granada, St. Vincent, Honduras, and Belize.

Note: This is the earliest document seen (Aug. 2009) concerning soybeans in Namibia. This document contains the earliest date seen for soybeans in Namibia (2001). Address: Plant Breeder and Director, Program I, Asian Vegetable Research and Development Center, P.O. Box 42, Shanhua, Tainan 741, Taiwan, ROC. Email: sundar@netra.avrdc.org.tw.

1631. **Product Name:** Soyco Tofu [Malaysian Peanut Satay, Chinese Honey Soy].
Manufacturer's Name: Soyco Soyfood Product [Nutrisoy Pty. Ltd.].
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia. Phone: 02-9695-7755.
Date of Introduction: 2001. August.
Ingredients: Malaysian: Organic soybean (55%) (non genetically modified), water, peanut sauce (peanut, onion, chilli, lemon grass, coconut cream, vinegar, garlic, ginger, spices, sugar, salt, modified maize starch), soysauce, sunflower oil, natural coagulant (magnesium chloride).
Wt/Vol., Packaging, Price: 200 gm.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Aug. 2001. Malaysian: Brown, green, red, orange, yellow and black on beige. "Rich new flavour. Ready to serve hot or cold."

1632. **Product Name:** Organic Silken Tofu, or Soft Tofu.
Manufacturer's Name: Nutrisoy Pty. Ltd.
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia.
Date of Introduction: 2001. October.
Ingredients: Silken Tofu: Organic soybean (non genetically modified), filtered water, natural calcium

sulphate, glucono delta lactone.
Wt/Vol., Packaging, Price: 300 gm pack.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling these products in Oct. 2001. Silken: Orange, purple, green, yellow and red on salmon pink. A color photo shows three slices of silken tofu in a bowl with a white sauce and cut vegetables. Nutrition information is given.

1633. Pfeil, B.E.; Tindale, M.D.; Craven, L.A. 2001. A review of the *Glycine clandestina* species complex (Fabaceae: Phaseolae) reveals two new species. *Australian Systematic Botany* 14(6):891-900. Dec. 18. [10 ref]
Address: Centre for Plant Biodiversity Research, CSIRO Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.

1634. White (Ellen G.) Estate. 2001. Abbreviations of EGW publications. Silver Spring, Maryland. 2 p. Unpublished typescript. Dec.
Address: Silver Spring, Maryland.

1635. **Product Name:** Zenzo Organic Burger Patties.
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 2001.
Ingredients: Certified organic ingredients: Soybeans, onions, palm kernel shortening, rice flour, pea flour, sugar, salt, spices, nigari.
Wt/Vol., Packaging, Price: 220 gm, vacuum packed inside paperboard box. 4 x vegetarian patties.
How Stored: Refrigerate at 4°C or less.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 2001, but it was first sold in this paperboard box in 2006. They started using the Zenzo brand name (for second generation soy products) in 2002. 4 by 4 by 1½ inches. Color photo of waves, surf, and ocean under a blue sky, beyond sand, green grass and a few yellow flowers, on a green background. Superb label design. Certified Organic logo. On side panel: "Consume within 24 hours once opened. Can be frozen." On one side is a list, with each item followed by a white box inside of which is a red check (= yes): Vegetarian. Vegan. Dairy free. Gluten free. Cholesterol free. Certified organic. High protein. High energy.

1636. **Product Name:** Soyco Silken Tofu [Smooth, or Silky Firm].
Manufacturer's Name: Soyco Soyfood Product [Nutrisoy Pty. Ltd.].
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia. Phone: 02-9695-7755.
Date of Introduction: 2002. January.
Ingredients: Soybean (non genetically modified), water, natural calcium sulfate, glucono delta lactone.
Wt/Vol., Packaging, Price: 300 gm.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Jan. 2002. Smooth: Red, green, yellow and black on brown.

1637. **Product Name:** Soyco Regular Tofu [Original, or Firm].
Manufacturer's Name: Soyco Soyfood Product [Nutrisoy Pty. Ltd.].
Manufacturer's Address: 15 Hannon St., Botany NSW 2019, Australia. Phone: 02-9695-7755.
Date of Introduction: 2002. January.
Ingredients: Soybean (non genetically modified), water, natural calcium sulfate.
Wt/Vol., Packaging, Price: 300 gm.
How Stored: Refrigerated.
New Product–Documentation: Labels with dates sent by Tony Wondal of Nutrisoy. 2005. April 26. He started making and selling this product in Jan. 2002. Original: Red, green, yellow, white and black on blue.

1638. Treloar, Brigid. 2002. Tofu. Singapore: Periplus Editions (HK) Ltd. Printed in Singapore. 112 p. Illust. (color). Index. 25 x 24 cm. Series: The Essential Kitchen.
• ***Summary:*** This is a beautiful book, with stylish and informative full-page glossy color photos on every other page. It is well researched, comprehensive, and generally uses standard tofu and soyfoods terminology. It is also strange: We are not told in which country the publisher is located (perhaps Hong Kong or Singapore) or where the author lives. It is distributed in North America, Japan and Korea by Tuttle Publishing. On the inside rear dust jacket: www.tuttlepublishing.com. It is clearly targeted at a world market.

Contents: Introduction. Tofu glossary (introduction, firm and soft tofu, firm and regular tofu, fresh tofu, silken tofu, soft tofu, extra firm tofu, powdered tofu {or instant tofu or soy milk powder}, nigari tofu, flavored or dessert tofu, grilled tofu {yaki-dofu}, deep-fried tofu {age}, freeze-dried tofu {koya-dofu}, thin deep-fried tofu {aburaage or usuage}, thick deep-fried tofu {atsuage or namaage}, seasoned tofu pouches {for *inari-zushi}*, tempeh). Creating texture and flavor. How to use tofu: How to cut tofu, making a chrysanthemum flower, how to remove excess moisture, how to change soft tofu into firm, how to prepare tofu for cooking (marinating, grilling, pureeing or blending, parboiling / braising, panfrying / stir-frying, scrambling, steaming, deep-frying, smoking, how to reconstitute freeze-dried tofu, how to prepare deep-fried tofu for cooking, substituting tofu in recipes). Appetizers Snacks and light meals. Soups. Baked dishes. Stir-fries. Grilled dishes. Noodles, couscous and rice. Vegetables. Salads. Desserts. Glossary (of general ingredients, incl. soy sauce, Teriyaki sauce). Guide to weights and measures.

Note: This is not a vegetarian cookbook. Some recipes call for pork, chicken, fish (salmon, trout, tuna), etc.

Talk with representative of Tuttle Publishing, Vermont. 2004. May 8. Brigid lives in Australia. Periplus, created in 1997 by Tuttle, is located in Singapore and a sister company of Tuttle. Address: Food writer, stylist, consultant, and cooking instructor [Australia].

1639. Pfeil, B.E.; Craven, L.A. 2002. New taxa in *Glycine* (Fabaceae: Phaseolae) from north-western Australia. *Australian Systematic Botany* 15(4):565-73. Aug. 29. [18 ref]

• ***Summary:*** Three new taxa [species] of Glycine are described: (1) *Glycine pullenii* B.E. Pfeil, Tindale & Craven. (2) *Glycine aphyonota* B.E. Pfeil. (3) *Glycine hirticaulis* subsp. *leptosa* B.E. Pfeil. The first two were found in Bungle Bungle–Purnululu National Park, Western Australia; the third at the Top End of the Northern Territory.

A map shows the distribution of five *Glycine* species in northern Australia. Address: Centre for Plant Biodiversity Research, CSIRO Plant Industry, GPO Box 1600, Canberra, ACT 2601, Australia.

1640. Slater, Nigel. 2002. Recipes: Nigel Slater's cookbook of the month. Thai Food by David Thompson. *Observer (London).* Nov. 10. p. 147.

• ***Summary:*** At last we have the definitive book on Thai cooking. David Thompson, who spent years in researching and writing this book, is the Australian chef at Nahm in London's Halkin Hotel; before that he was owner of the Darley Street Thai in Sydney.

Recipes include: Stir-fried Siamese watercress with yellow beans, garlic and chillies *(Pak bung fai dtaeng;* with "2 tbsp yellow bean sauce, rinsed" and "2 tbsp light soy sauce"). "This simple dish can be enhanced with... roast duck and fermented bean curd."

1641. *Canadian Soybean Bulletin (OSG, Chatham, Ontario, Canada).* 2002. Canadian soybean exports. Winter. p. 2.

• ***Summary:*** A large table shows statistics in tonnes (metric tons) of soybeans exported to various countries, and regions, each year from 1998/99 to 2001/2002. The countries are: In Asia–China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, and Thailand. In Western Europe–Austria, Belgium, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, and Spain. By continent–Africa, Central America, Eastern Europe, Middle East, Oceania, South America, and United States.

In 2001/2002 the countries to which the largest amount of Canadian soybean exports went were (in tonnes): Japan 126,619, Malaysia 101,698, United States 60,244 Germany 29,377, Indonesia 26,836, Hong Kong 22,800.

Total soybean exports have declined dramatically during the past two years, from a peak of 946,360 in 1999/2000, to 746,241 in 2000/2001, down to 471,492 in 2001/2002.

1642. Treloar, Brigid; Inge, Karen. 2002. Healthy soy: Cooking with soybeans for health and vitality. Hong Kong: Periplus Editions (HK) Ltd. Printed in Singapore. 112 p. Illust. (color). Index. 24 x 22 cm.

• ***Summary:*** This is a beautiful book, with stylish and informative full-page glossy color photos on every other page. It is well researched, comprehensive, and generally uses standard soyfoods terminology. It is also strange: We are not told in which country the publisher is located (perhaps Hong Kong or Singapore) or where the authors live. It is distributed in North America, Japan and Korea by Tuttle Publishing. On the inside rear dust jacket: www.tuttlepublishing.com. It is clearly targeted at a world market.

Contents: Introduction. The health benefits of soy: The heart, cancer, menopause, osteoporosis, weight control, allergies, lactose intolerance, the nutritional value of soy, protein, phytoestrogens, fats, calcium, soluble fiber, vitamins and minerals, energy, carbohydrates, how much soy do we need? (as an exchange for meat), how to use the nutrition table. Nutrition table (for various soyfoods). Soybeans: Green soybeans–fresh and frozen, dried soybeans, how to buy and prepare soybeans (selecting and storing dried soybeans, preparing dried soybeans, soaking, pan-roasting, boiling, pressure cooking, canned). Soy foods: Tofu (selecting and using, storing, freezing), bean curd sheets (yuba), deep-fried tofu (age; seasoned tofu), miso, tempeh, soya sauce (shoyu; regular, low-salt, light, tamari, ketjap manis), soy milk, soy flour, soy nuts, soy germ powder, soy oil, soybean sprouts, soybean paste (fermented), natto, soy dairy products (soy butter, soy spread {margarine}, soy cheese {plain or flavored}, cream cheese, yogurt, mayonnaise), soy meats (meat alternatives), others (soy breads, cereals, pasta, chocolate, chips, health bars, desserts, tofu ice creams), soy grits, tips (tofu, soy dairy products). Compatible soy flavors. Preparation and cooking techniques: Draining and pressing tofu, cutting tofu, deep-frying tofu, how to reconstitute yuba, how to use deep-fried tofu pouches, how to use miso, miso tips. Soups. Appetizers and dips. Light meals and snacks. Main dishes. Seafood. Vegetables. Salads. Desserts. Soy drinks. Glossary. Guide to weights and measures.

Note: This is not a vegetarian cookbook. Some recipes call for chicken, fish (swordfish, tuna, salmon), shrimp, etc. Address: 1. Food writer, stylist, consultant, and cooking instructor [Australia]; 2. Nutritionist and nutrition correspondent for *Good Morning Australia*.

1643. White (Ellen G.) Estate. 2002. Legacy of Light: An interactive journey of faith, heritage, & prophecy (Compact disc–CD-ROM). Silver Spring, Maryland.
• ***Summary:*** Contents of this two-CD interactive multimedia collection: (1) Library. All of Ellen White's 375 published works with a comprehensive index. Take a self-guided tour of the White Estate Vault. (2) Time Lines: Interactively explore more than 70 years of Seventh-day Adventist history, (3) Photo gallery: View more than 150 original photographs of Adventist pioneers, the White family, and related institutions, including 3-D stereoviews. (3) Reel to Real: Video vignettes relating to the life and ministry of Ellen G. White. (4) Learning Center: Teach children about the past through painting, puzzles, and memory games. And much more.

A note states: "EGWebSite news: www.WhiteEstate.org. We've recently provided access on our website to a new, updated database of Ellen White's complete published writings. It is HTML-based, fully searchable and browsable." Select search, then search asp. Also issues, issues.asp. And books, books.asp. Address: Silver Spring, Maryland.

1644. Praestiin, Julie. 2003. Sanitarium buys out Soyaworld. *Record (SDA, Victoria, Australia)* 108(2):3. Jan. 18.
• ***Summary:*** Kevin Jackson, CEO of Sanitarium Foods (Australia), recently announced the company successful purchase of Soyaworld in Canada. "'On entering the initial agreement [about 2 years ago] we purchased half of the business and also negotiated an option to buy the remaining part of the company. We have now exercised our option to purchase the remaining 53% of Soyaworld, and, as such, we now own 100 per cent of the Canadian company' said Mr Jackson on announcing the takeover."

Soyaworld, which produces So Good soymilk, now has a 60% share of the soymilk market in Canada. Its current annual sales is about $A46 million (Australian). A photo shows Kevin Jackson. Address: Berkeley Vale, NSW, Australia.

1645. Jones, Christina. 2003. Making tofu in Australia (Interview). *SoyaScan Notes*. May 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** She and her partner have been making tofu for a short time and selling a little of it. But they were not the first ones in Tasmania to make tofu commercially. The pioneers were people who made and sold tofu in their restaurant. She plans to order *Tofu & Soymilk Production* and *Tempeh Production* published by Soyfoods Center.

Update. Talk with Christina. 2003. June 11. She first sold tempeh in May 2003. Address: 124 Fourfoot Rd., Geeveston, Tasmania 7116, Australia. Phone: (3) 6297 1293.

1646. *Ontario Soybean Growers Newsletter.* 2003. The Australian soybean industry. May. p. 5.
• ***Summary:*** "This article was written by Dr. Malcolm Morrison, an Oilseed Physiologist with Ag Canada. He is currently on a study leave in Australia.

"In 2002, Australia produced 70,000 metric tonnes of soybean on 30,000 ha (74,000 acres) of land. Major production areas are in southern Queensland and northern New South Wales, with pockets in other irrigated regions of the country. Soybeans are planted during summer and most production is irrigated. Soybeans are used as a green manure crop in sugar cane, returning 40 to 300 kg/ha (35-267 pounds / acre) of nitrogen, depending on whether the seeds are harvested or the crop ploughed in green.

"Annual Australian demand for soybeans far outstrips national production. The crushing industry imports about 40,000 tonnes of seed and the livestock industry imports up to 360,000 tonnes of solvent extracted meal, mostly from the United States. The baking industry uses another 14,000 tonnes of Australian grown, full-fat soy flour.

"With the drought of 2002-2003, production has dropped by 50%. Farmers have only planted the crops that they could afford to irrigate. This year it was almost as profitable to sell stored water as it was to plant and harvest a field of soybeans. In the irrigated cash crop regions, soybeans are last on the list of preferred crops after cotton, corn, grain sorghum, and sunflowers.

"Phytophthora, white mold, mildew, and soybean rust are major diseases, while insect pests are silverleaf whitefly, green veggie bug, aphids, scale bugs and mites. Plant breeders are developing disease resistant varieties and pest specialists are releasing parasitic insects, and creating viral and fungal biopesticides. Plant breeders are selecting white hilum varieties with good yield, agronomics and natto and tofu characteristics. Many of the new varieties have Canadian parents and are being tested in Asia with favourable results.

"The Australian soybean industry is beginning to target the same high value soyfood markets in Asia that Canada has been focusing on for years. Australia has a 'clean/green' reputation since they do not produce GMO food crops. They intend to capitalize on this image to capture food grade soybean niche markets in the near future. Producing an assured supply of high quality, non-GMO soybeans will be a challenge in the Australian environment." Address: Chatham, ONT, Canada N7M 5L8.

1647. Hymowitz, Ted. 2003. Outcrossing, cross pollination, or unwanted crossing in soybeans (Interview). *SoyaScan Notes.* Aug. 25. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Monsanto wants to know more about soybean gene contamination, especially the probability that genes from their genetically engineered (GE) soybeans might escape into non-GE soybeans.

Two major questions are: (1) What is the mechanism by which this contamination takes place? Answer: Bees. (2) What does it mean? Answer: Nobody knows, because in certain instances the cross between the soybean that has the genetically modified trait and, for example, and organic soybean, may not be adaptive (it may have no selective advantage), so it will gradually work its way out (fade out), like any gene that is randomly introduced and has no selective advantage.

The idea that Nature promotes the spreading of genes may be true for crops like maize which are wind pollinated, but soybeans are "self-pollinated" so the percentage of "outcrossing" or cross pollination is very low. Soybean breeders leave 9 feet of space between plots of different varieties; that is all the space you need. Soybeans can cross only if there are bees carrying the pollen; there is no wind pollination. Moreover bees work up and down rows; they don't jump around.

So when non-GE soybeans get contaminated with GE soybeans, the latter whole soybeans probably slipped in, or the original seeds were somehow contaminated.

The wild perennial soybean variety *G. gracilis* may have resulted in East Asia from a cross between *Glycine max* and *Glycine soja*–both annuals.

In Australia, it would be very difficult for the various species of wild perennial soybeans to cross accidentally with the cultivated soybean *(G. max)*, which is an annual.

However this is not the case in northeastern China. Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1648. Hymowitz, Ted. 2003. Position on genetically engineered soybeans–a position which has evolved over many years as a plant geneticist (Interview). *SoyaScan Notes.* Oct. 1. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Why do intelligent soybean farmers in northern U.S. states grow genetically engineered soybeans? Answer: (1) The information is extremely confusing. There are so many variables and choices for farmers. (2) For GE soybeans, the yields are now generally higher and the total production costs are generally lower than for non-GE soybeans. Breeding is a numbers game and the big seed companies can afford to have huge numbers of plots. (2) They want to simplify the number of variables and unknowns, such as price of fuel (3) Fewer and fewer non-GE varieties are available from seed companies to farmers. Today Monsanto and Pioneer Hi-Bred still offer a few non-GE lines. And a few seed companies cater to organic farmers and non-GE farmers who sell their soybeans, for example, to tofu companies in Japan. But for most farmers, it takes too much effort to try to evaluate many varieties.

The future of GE soybeans is partly a political issue. It started in the Clinton administration when Monsanto put tremendous on the government to push GE soybeans. The U.S. government should be in the business of helping to market U.S. crops, but it should try to provide foreign markets with whatever they want, rather than trying to push certain commodities or crops on them. For example, Russians like the dark meat from chickens and turkeys, whereas Americans like the white meat. So the U.S. sells Russia large amounts of dark meat–which is almost a waste product in the USA. "It is a match made in heaven." Shapiro lost his job at Monsanto and severely hurt the company with his pushy attitude.

Ted believes that if GE crops had been allowed to evolve naturally, they would have won out in the long run. For example, GE cotton is working extremely well in China. People don't eat cotton and the herbicide saves Chinese farmers the back-breaking labor of hoeing. Moreover, glyphosate is one of the least toxic herbicides to animals; it breaks down quickly into carbon dioxide and water.

Monsanto's patent on glyphosate has expired. But they have many factories and much know-how in place to keep producing it. So Dow and Dupont each negotiate with Monsanto for the best price they can get for glyphosate, which is now a commodity. China and Israel are now making low-cost glyphosate, which costs about $0.35/ gallon. The free market is working nicely.

The position of non-believers on GE crops is that they need to be tested more, and that we have to be careful not to let the genie out of the bottle, for it can never be put back in. Ted disagrees; he sees no troubling health or environmental risks. First, soybeans will not cross-pollinate with wild species in the USA and most other major soybean producing areas; the only countries where there is concern are China and Australia. Even if GE corn crosses with its wild ancestors, there is no guarantee that the hybrid will have a selective advantage. If it has none, the trait will fade away in time. As soybean yields rise, the extra land could be set aside for useful or natural purposes. There will be changes in weed populations, but that has happened throughout history as new agricultural technologies (such as the moldboard plow and the herbicide 2,4-D) have been introduced. Moreover, Roundup is not 100% effective on all weeds; so the other weeds will gain an advantage and require herbicide blends–which are already available. There are so many checks and balances, that if a problem arises, it will probably be caught at an early stage and eliminated.

Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1649. Richmond, Akasha. 2003. Clarke Irvine and *Let's Live* magazine. (Interview). *SoyaScan Notes.* Nov. 7. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** Gordon Kennedy asked Akasha if she had any copies of *Let's Live* magazine prior to the 1950s. She bought an original issue online from abebooks dated Sept. 1945. It is in excellent shape, and contains ads for Bill Baker's soya bread, for Cubbison's Hollywood Cup and Soyfee Coffee, for El Molino Soya Flour, for Gayelord Hauser's products, and an ad Clarke Irvine inserted in his own publication, announcing the sale of a health food store–which he was brokering it for someone.

Then she did a Google search on *Let's Live;* the magazine is still being published and their office is in Santa Monica. She called and talked to the editor, Beth, who is very interested in the early history of health foods in the Los Angeles (LA) area. More important, they have every issue of the magazine from Day One, bound, in their office. She is going down there on Monday morning. Akasha wants to profile Clarke Irvine in her book; he was the first publisher and he was very involved in the movie industry.

Shurtleff tells Akasha that in Jan. 1933 Irvine started a biweekly newspaper in Hollywood titled *California Health News. A National Journal of Better Living.* On 15 May 1942 he changed the name to *Let's Live.* Akasha says that in Aug. 2003 they celebrated their 70th anniversary; she will see if *Let's Live* has copies of earlier issues of the newspaper.

Then Akasha did a Google search for Clarke Irvine and found a website irvineclan.com, which contains 400 years of his family's genealogy. There was a page about him, which she printed. He was born in 1893 in Salem, Oregon. He later moved to Santa Monica. His first wife, Margaret Robertson who was Australian, left him in about 1946, when he was living in a trailer park. Later in 1946 he married again to Alice Marks who, within the space of 2-3 years presented him with a first daughter, then twin daughters. So his daughters must be in their 50s. Clarke went on to be the publisher of the *Alpine Sun,* "America's tiniest newspaper." They talk about all the movie stars who were his friends. Then he went into business leasing trailers to movie people in Santa Ynez Canyon. He was writing a book about early Hollywood–according to the June 1964 issue of the *Star News and Venice Vanguard,* by staff writer Bill Henderson–who also noted at Irvine's Alpine Sun was still going with the able assistance of reporters Cynthia, Celeste, and Cecilia. Akasha is on the case and hoping to find one of his daughters. They moved to Alpine (directly east of San Diego very near Cleveland National Forest). She has emailed the website requesting more information about the relatives of Clarke Irvine.

She found a man in Burbank, California, who collects old magazines and newspapers. She went to his shop last week, looked around, and gave him a list of what she wants. He has six issues of the *Los Angeles Times* containing Mike Lovell's "Care of the Body" column. She says "I just love this."

The California Culinary Historians in LA (many of whom are now in their '70s), have a newsletter. She will submit a request for information related to her book. Address: Los Angeles, California.

1650. Brown, Reg. 2003. Back to the beginnings: 3. *Record (SDA, Victoria, Australia)* 108(47):8-9. Nov. 29.

• ***Summary:*** "This article continues a series on the history of the Adventist Church in the South Pacific." In 1897, Edward Halsey, one of Dr. John Harvey Kellogg's bakers at the Battle Creek Sanitarium, Michigan, arrived in Melbourne, Australia, and began manufacturing Granola, caramel cereal (a coffee substitute), and peanut butter. "The Sanitarium Health Food Company was registered as a business on April 27, 1898." On the advice of Ellen G. White, the health food factory was moved to Cooranbong, NSW, to be near the newly established school at Avondale.

Sanitarium Foods is the soymilk market leader in Australia. Its flagship product, So Good, enjoys almost 50% of the market share, and is also the leading brand in New Zealand, the UK, and Canada. So Good was developed at Sanitarium's laboratory at Cooranbong. "In 2002 Sanitarium purchased a Canadian company, Soyaworld, which gives it 60 per cent of the Canadian [soymilk] market." Address: Australia.

1651. Apple, R.W., Jr. 2003. A Chinese jewel in Melbourne, striving toward perfection. *New York Times.* Dec. 24. p. F1.

• ***Summary:*** The Flower Drum, the most famous restaurant in Melbourne, and perhaps in all of Australia, opened in 1975, founded by Gilbert Lau–who was born and raised near Canton. The menu is fundamentally Cantonese, but open to other influences, including many of Australia's unique and delicious ingredients.

One dish is a lamb clay pot, "starring a cheap cut of Australia's favorite meat, called the flap, made tender by long cooking in moist heat, with fermented bean curd that tasted vaguely like cheese, and spinach plunged into the broth for just a moment. Delicious. So delicious that customers from Hong Kong come in and order 20 pounds to go."

1652. Nestel, Paul. 2003. Isoflavones: Their effects on cardiovascular risk and functions. *Current Opinion in Lipidology* 14:3-8. *

1653. Teede, H.J.; McGrath, B.P.; DeSilva, L.; Cehun, M.; Fassoulakis, A.; Nestel, P.J. 2003. Isoflavones reduce arterial stiffness: A placebo-controlled study in men and postmenopausal women. *Arteriosclerosis, Thrombosis, and Vascular Biology* 23:1066-71. *

1654. **Product Name:** Organic Teriyaki Sauce.
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 2003.
Ingredients: Certified organic ingredients: Fermented soy beans, sea salt, cider vinegar, honey, ginger, garlic, water.
Wt/Vol., Packaging, Price: 275 ml glass bottle.
How Stored: Shelf stable.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 2003. White, black, and beige on red. 2.25 by 6.5 inches. "Ideal as marinade, condiment, or tasty cooking ingredient."

1655. Food and Agricultural Organization of the United Nations. 2003. Soybeans: Area harvested, yield, and production. *FAO Yearbook–Production (Rome, Italy)* 57:115-16.
• ***Summary:*** The 2003 Production Yearbook, under "Soybeans" (p. 115-16, in English, French, and Spanish) gives area harvested (1,000 ha), yield (kg/ha), and production (1,000 metric tons), each for the years 1989-91, 1995, 1996, 1997, for the following places: World. Africa: Benin, Burkina Faso, Burundi, Congo–Democratic Republic, Cote d'Ivoire, Egypt, Ethiopia PDR, Ethiopia, Gabon, Liberia, Madagascar, Morocco, Nigeria, Rwanda, South Africa, Tanzania, Uganda, Zambia, Zimbabwe.

North and Central America: Belize, Canada, El Salvador, Guatemala, Honduras, Nicaragua, Panama, USA.

South America: Argentina, Bolivia, Brazil, Colombia, Ecuador, Paraguay, Peru, Suriname, Uruguay, Venezuela.

Asia (fmr = former). Asia: Azerbaijan, Bhutan, Cambodia, China, East Timor, Georgia, India, Indonesia, Iran, Iraq, Japan, Kazakhstan, Korea–Democratic People's Republic of (north), Korea–Republic of (south), Laos, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Syria, Tajikistan, Thailand, Turkey, Viet Nam (Vietnam).

Europe (former). Europe. Albania, Austria, Bosnia Herzegovina, Bulgaria, Croatia, Czechoslovakia, Czech Republic, France, Germany, Greece, Hungary, Italy, Moldova Republic, Romania, Russian Federation, Serbia-Montenegro, Slovakia, Slovenia, Spain, Switzerland, Ukraine. Note: Serbia-Montenegro appears for the first time. Harvested 112,000 ha (yield = 2,099F kg/ha) in 1999-2001, 87,000 (yield = 2,369F) in 2001, 100,000 (yield = 2442F) in 2002, and 131,000 (yield = 1,720F) in 2003. Produced 224,000 metric tons in 1999-2001, 207,000 MT in 201, 244,000 MT in 2002, and 226,000 MT in 2003.

Oceania. Australia.

Note: In this 2003 Yearbook the USSR was not listed for the first time in the history of the publication.

1656. Orr, Roger. 2003. Crop development report: Edamame Japanese vegetable soybean. Seed introduction, multiplication and observations. Launceston, Tasmania, Australia: Dept. of Primary Industries, Water and Environment, Vegetable and Associated Industries Branch. 5 leaves. Color illust. 30 cm. *
Address: Launceston, Tasmania, Australia.

1657. *The Non-GMO Source (Fairfield, Iowa).*2004. Taiwan's demand for non-GM and organic soybeans increasing. 4(2):3. Feb.
• ***Summary:*** Taiwan has a large market for soybeans for food use, estimated at 225,000 tons. Most of the soybeans are used to make tofu and soymilk. In 2002/03 about 7,500 tonnes (metric tons) of the food-use soybeans came as identity preserved, non-GM "food grade," and organic. Of this total the USA supplied an estimated 4,500 tonnes, Australia 2,000 tonnes, Canada 500 tonnes, and all other countries combined 500 tonnes.

1658. Drosihn, Bernd. 2004. Update on soyfoods in Europe. Part II (Interview). *SoyaScan Notes.* March 15. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Soymilk: A major new soymilk maker in Europe is named Wild (www.wild.de), an old German food company that specializes in fruits and ingredients; their retail soymilk is named Soy and Joy. Their most famous brand is Caprisun, a non-soy drink in a foil pouch, well known in the USA. They and So Good, the Australian soymilk now made with Solae, are both strong competitors of Alpro.

Several weeks ago Hain-Celestial of New York purchased two German soymilk makers, both owned by Bruno Fischer, Jr.: Natumi and Gut Honneroth. He sold both companies at a low price–probably because he had to. Bruno had gotten his soymilk into Aldi, the mother company of Trader Joe's and the No. 1 discounter in Germany–and maybe in all of Europe, and he developed a large soymilk business with Aldi–perhaps so large he could no longer handle it himself. Bruno also made a lot of private label soymilk. With Hain, Bruno found a large German dairy to make soymilk for Aldi under a new Aldi brand. The new European CEO of Hain-Celestial is Philippe Woitrin, who was CEO of Lima Foods when Hain acquired it.

Triballat makes the best soy yogurts (Sojasun brand) in the world–in Bernd's opinion. They have a new brand, Sojadé, which are delicious creamy yogurt drinks–maybe organic. The Japanese Yakult concept of drinking live beneficial probiotic bacteria each morning has now caught on in a big way in Europe. Yakult is one of the best entries into the European food market in years. Bernd just saw

White Wave's Silk Alive, a similar product, at the Anaheim Natural Products Expo. But he liked the Wildwood smoothie even better, and the WholeSoy fermented soymilk best of all American products.

In France a small company named Sojami (pronounced so-zha-MEE), which started about 10 years ago, makes very creative, unique, and interesting soy cheeses and cultured soy yogurts. The founder has a university research background and is a very nice guy.

Tofu: Tofu consumption in Europe has expanded steadily over the past 5-7 years, but it is still a very small product. The largest maker of the tofu and tofu products sold in Germany is Life Food GmbH / Taifun Produkte, run by Wolfgang Heck and Guenter Klein. Heuschen-Schrouff B.V. (Landgraaf, Netherlands) and Viana are tied for second place. About 10 years ago, Heuschen-Schrouff started selling their tofu under the organic So Fine brand (www.sofine.nl). An Indian-run company in Kerkrade, Netherlands, run by the brothers Singh (both Sikhs), makes tofu mostly for the Asian (Indonesian) market. In 2001 Viana started selling its tofu to the mainstream market under the Veggie Life brand; this English-language brand name communicates will to people speaking many different languages throughout the EU (European Union)–though distribution is still limited to Germany and Austria. Soto Tofu, formerly run by Rolf Barthof has been sold to a very large dairy company, Algäuland. Viana's main products are tofu and tofu products–such as meat and cheese alternatives. Viana is #1 in Germany in meat alternatives. Germans buy soyfoods for three main reasons: They are good for one's health, they taste good, and good for the environment. Bernd is a vegan, but about 90% of Viana's products are sold to non-vegetarians.

Early tofu companies still active in Europe include Sojafarm (founded and still run by Lothar Stassen), Albert's Tofuhaus (Albert Hess; exports lots of his products to France). A basic problem with the smaller, early tofumakers in Germany is that they didn't have the creativity or power to put a brand on the market. So both these companies produce a lot of tofu under private labels. Lothar bought the Svadesha brand (Svadesha was the first German tofu company) and produces tofu under the Svadesha brand. About 2-3 years ago he also purchased the Nagel's Tofu brand from Christian Nagel, who now markets the tofu under his former brand. So Lothar makes tofu under 3 brands. Berief Feinkost (in Beckum, northern Germany), started 10-15 years ago, tries to cover the mainstream tofu market, but not very successfully. Kassel Tofu Kato (started by Gyoergy / Yuri Debrecini, who was at Soyastern). Thomas Karas is no longer involved with soyfoods; tried to enter the computer business but Bernd does not know what he is doing now. In Spain, the market leader is Natursoy near Barcelona. Nearby is Salvador Sala of Vegetalia. In Spain, there is a lot of interest in and rapid growth of soyfoods and organic foods. In Italy the Ki Group (Schenker) owns a tofu company–fairly old but not very creative.

In the United States, Pulmuone now has three U.S. factories; their first one in Southgate, southern California, a new one at Fullerton, California, and a 3rd one in New York. The Fullerton factory is the most modern Bernd has ever seen. There they make Gourmet Tofu, introduced in about Jan. 2004, which is presliced and marinated, in 4 flavors / styles: Baked, Sliced, and Marinated.

Meat alternatives: Nestle now owns Osem which owns Tivall, the Israeli maker of meat alternatives. Since all of Tivall's products are held together by eggs or egg whites, none of them are vegan–and none are organic. Quorn, which also contains lots of egg protein, is owned by AstraZeneca [Marlow Foods]–which wants to sell the company because growth and profits have been lower than expected. DE-VAU-GE in Germany is a very big company, they make large amounts of meat alternatives (incl. burgers), and they do a lot of business with Aldi in breakfast cereals–not in soyfoods. Bernd thinks they are good, and very economical manufacturers, but they are not very creative and they have no USP (unique sales point); moreover, many of their products contain egg protein, but their quality is lower than that of Tivall. Bernd believes his meat alternatives are as good as Tivall's, but more expensive, in part because of organic ingredients. Tivall makes its raw materials in Israel, then exports these to Europe for cutting and flavoring.

Klaus Gaiser owns Topas which sells Viti brand meat alternatives based on wheat gluten, with no soy; he owns the brand and markets the products, but he has meat companies manufacture them. However, when his typically 3-year contract with the manufacturer expires, he has to find a new manufacturer, but the previous one keeps making his products under their own brand. In the USA: At Turtle Island Foods (Hood River, Oregon), Bernd met Hans Wrobel, a German who does product development. Note: Hans and Rhonda Wrobel of The Higher Taste developed Tofurky in Portland, Oregon. Bernd makes Pizzarella, a tofu-based cheese alternative. Address: Founder and president, Viana Naturkost GmbH, 54578 Wiesbaum / Vulkaneifel, Germany. Phone: +49 06593-99670.

1659. Brown, Allan; Brown, Susan. 2004. Tempeh tofu and other new developments (Interview). *SoyaScan Notes.* March 20. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** They recently had a visitor who makes "tempeh tofu" commercially in Australia. Tempeh is probably pasteurized then crumbled and added to the tofu curds before they are pressed into tofu. When you slice the tofu, there is a marbled effect with tempeh in the middle. The visitor is sending Allan the labels. "What a great, original idea!" It is widely distributed and Australians love it because it has more flavor than tofu and it is not as heavy as tempeh."

In Vancouver, BC, a company named Gaia Enterprises Inc. makes natto and sells the spores. Noble Bean has been thinking about making natto, but Shurtleff warns against letting natto spores (a strong contaminant) get near tempeh.

Two years ago, Soy City Foods joined with another company, Second Nature, to become Sol Cuisine. They still make lots of good tofu but they have stopped making tempeh; they made only okara tempeh (to add value to the okara left over from making tofu) and only for the institutional market (mostly university cafeterias). The nutritional profile and consistency were both poor. Sol Cuisine is using certified organic soy isolates to make meat alternatives (incl. ground round, hot dogs, etc.), thereby challenging Yves, which uses regular isolates–perhaps made using hexane. The sales manager at Sol Cuisine is a close friend of Allan and Susan's from The Farm. Sol Cuisine wanted Noble Bean to private label tempeh for them. Allan now wants to talk with them about making "tempeh tofu."

The Farm in Summertown, Tennessee, is now a good, reliable source of tempeh spores. Noble Bean gets all its tempeh spores from the Farm.

Sooke Soyfoods has become Green Cuisine in British Columbia; established in 1989, they have a vegan restaurant and also make a line of soyfood products. Address: Founders, Noble Bean, R.R. #1, McDonalds Corners, ON K0G 1M0 Canada. Phone: 613-278-2305.

1660. Teede, Helena J.; Dalais, Fabien S.; McGrath, Barry P. 2004. Dietary soy containing phytoestrogens does not have detectable estrogenic effects on hepatic protein synthesis in postmenopausal women? *American J. of Clinical Nutrition* 79(3):396-401. March. [32 ref] Address: 1, 3. Vascular Research Group, Dep. of Medicine, Monash Univ., Clayton, Australia.

1661. Aguilar, John. 2004. News: Thumbs down all around for GMOs. *Natural Foods Merchandiser.* May. p. 9.
• ***Summary:*** Thumbs down for GE rice in California, and GE wheat in the Dakotas. Western Australia banned growing of GEOs.

1662. Dansby, Angela. 2004. Global adoption of biotech crops rising: European Union wild card on future acreage and rate of adoption. *Seed World* 142(5):6, 8-9. May.
• ***Summary:*** As of 2003, 18 countries have adopted genetically engineered (GE) crops. The countries with the largest GE acreage (in million acres) are USA 42.8, Argentina 13.9, Canada 4.4, Brazil 3.0, China 2.8, South Africa 0.4, Australia 0.10, India 0.10, and Romania and India each less than 0.1.

The European Union's regulations on biotech food and feed traceability and labeling went into effect on 18 April 2004; these are seen as paving the way for new GE crop approvals, and ending the EU's 5-year ban on them. "The rules, officially adopted in July 2003, require food and animal feed to be labeled if they contain 0.9 percent or more biotech ingredients." Address: Editor, Seed World.

1663. Soy Online Service. 2004. Uncovering the truth about soy (Website printout–part). www.soyonlineservice.co.nz. Printed Oct. 28.
• ***Summary:*** A virulently antisoy website, with many links to other sites, anti-soy articles and books, etc. It was clearly initiated in New Zealand by the small group containing Richard and Valerie James and Mike Fitzpatrick. They were soon joined by Sally Fallon in the USA, and others (unknown) in the UK.

Contents: Home page–Site map (7 p.). 1. Introduction (4 p.). 2. History. 3. Hot reading. 4. Phytoestrogens: Soy & DES, the thyroid, male health, your baby, infertility, menopause, birth defects, cancer/leukemia, diabetes: Type 1, immune function, your pets, cognitive function [Lon White]. 5. Phytosterols. 6. GM soy. 7. Soy sauce. 8. Other toxins. 9. Doses simplified. 10. Soy allergies. 11. Soy politics. 12. SOS guidance. 13. Downloads. 14. Links. 15. Hot news. 16. Regulators. 17. Big Ugly Bull: Sanitation, FDA-CF-SCAN, Novogen, Abbott, Dr. Brian Strom, USDA, Unilever, NZ MOH (New Zealand Ministry of Health), ANZFA, Plunket, Israeli Officials, USB [United Soybean Board], Solae / DuPont / Bunge. 18. Testimonies. 19. Chicken roost.

A counter near the bottom of the Home Page states that this site has had 476,892 visitors since 27 April 1999. The information on this site cannot be printed unless you select the particular text you wish to print.

1664. Smith, Fiona. 2004. Easy sushi rolls and miso soup. London and New York: Ryland Peters & Small, Inc. 64 p. Illust. (Color photos by Diana Miller). Index. 20 x 20 cm.
• ***Summary:*** Contents: Serving sushi rolls. Cooking rice. Vegetarian. Fish and seafood. Meat and poultry. Miso soups. Accompaniments.

The page facing each recipe is a full-page color photo. Nori is used to wrap or roll most of sushi. Contains a selection of miso soup recipes that traditionally end a sushi meal: Dashi and combination miso soup. White miso soup with wakame, tofu and lettuce. Red miso soup with pork and noodles. Red miso soup with scallions and tempura croutons.

The vegetarian sushi recipes include: Miso-marinated asparagus roll. Broiled tofu roll. Address: Food writer and food stylist, New Zealand.

1665. Soy Online Service (Website printout–part). 2005. http://www.soyonlineservice.co.nz. Printed March 29.
• ***Summary:*** An anti-soy website. "When we [Richard and Valerie James] first questioned the safety of soy a representative of Protein Technologies told us that they: Had teams of lawyers to crush dissenters, could buy scientists to give evidence, owned television channels and newspapers, could divert medical schools and even influence governments."

"If you only knew the power of the dark side"–Darth Vader.

1666. Hymowitz, Ted. 2005. The two species of soybean rust (Interview). *SoyaScan Notes.* March 31. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** The soybean rust *(Phakopsora pachyrhizi)* indigenous to Asia and Oceania (Australia, New Zealand) is now coming to be called "Asian soybean rust;" it much more aggressive, virulent and harmful that its relative, *Phakopsora meibomiae,* which is indigenous to the Western Hemisphere / New World, and which is relatively non-aggressive and benign.

Since plant pathologists find it very difficult to differentiate between the two species of rust, they now sequence the proteins to make sure.

Rust was first reported on soybeans in Brazil in about 1993-1995, but it was eventually decided that it was not the aggressive species. That was the first time plant pathologists realized there were two species.

Note: Soybean rust was first reported on soybeans in the Western Hemisphere in 1976 in Puerto Rico. At the time, that rust was identified as *Phakopsora pachyrhizi* by a plant pathologist at USDA's Plant Disease Research Laboratory (PDRL), Frederick, Maryland (Vakili and Bromfield 1976, p. 996). Address: Prof. of Plant Genetics, Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1667. Nutrisoy Pty. Ltd. 2005. Home page and four links (Website printout–part). http://www.nutrisoy.com.au. 9 p. Printed April 12.
• ***Summary:*** Contents: Home (2 p.). About us (1 p.). Product information (1 p.; tofu and tempeh). Nutrisoy products (2 p.). Soyco products. Where to buy. Recipes. Contact us. Privacy policy. email: info@nutrisoy.com.au.

About us: Nutrisoy is a family owned company established in 1984. "In 1992 Nutrisoy attained the standards set down by Biological Farmers of Australia to become a certified processor of organic tofu and tempeh.

"Nutrisoy uses only the finest Australian Grown Soybean (free from genetically engineered soybean) which is a rich source of isoflavones / phytoestrogens, a substance that could offer protection against and help reduce the risk of a wide range of disease in men and women including prostate, breast and skin cancer, osteoporosis, hot flushes, and heart diseases." A large color photo shows Nutrisoy's many products.

Nutrisoy products: The colorful front panel of each of the following is shown: Plain firm tofu. Tofu vegies [sic]. Tofu tempeh (This tofu has chunky tempeh in it and has been marinated in shoyu and ginger). Tofu herbs. Tofu spicy. Tofu teriyaki. Tofu vegies burger. Tofu tempeh burger. Strawberry tofu (dessert in a cup, with real fruit sauce on top). Apricot tofu (dessert in a cup).

Note: Nutrisoy is the inventor of Tofu tempeh, and Tofu tempeh burger. Address: 15 Hannon St., Botany (suburb), Sydney, NSW 2019 Australia. Phone: +61 2 9316 5171.

1668. Wondal, Tony. 2005. Major events of Nutrisoy Pty. Ltd. (Chronology). Letter to William Shurtleff at Soyinfo Center, April 26. 1 p. On color letterhead.
• ***Summary:*** 1984 March–Nutrisoy Pty Ltd is incorporated. The address is 225 Forest Road, Arncliffe, NSW 2205, Australia.

1984 Nov.–Starts making and selling tempeh.

1986 Aug.–Starts making and selling flavoured tempeh.

1989 Dec.–Starts making and selling tofu.

1990 June–Starts making and selling pre-cooked tofu.

1992–Attains the standards set down by Biological [Organic] Farmers of Australia to become a certified processor of tofu and tempeh.

1993 Sept.–Starts making and selling tofu dessert.

1994 July–Starts selling tofu and tempeh to supermarket chain stores.

1994 Nov.–Moves to a larger factory (1,000 square meters). The address is 15 Hannon St., Botany NSW 2019, Australia.

1999 Dec.–Starts making and selling tofu dip.

2002 Jan.–Starts making and selling silken tofu.

2003 March.–Starts exporting soyfoods to New Zealand.

2004 July.–Starts exporting soyfoods to New Caledonia.

2005 Feb.–Moves to a larger factory (3,000 square meters). The address is Lot 1, 19a Baker St., Banksmeadow, NSW 2019, Australia. Address: Founder and President, Nutrisoy, New South Wales, Australia. Phone: +61 2 9316 5171.

1669. Sweets, Laura E.; Wrather, J. Allen; Wright, Simeon. 2005. Soybean rust. http:muextension.missouri.edu/explore/agguides/crops/g04442.htm. 2 p.
• ***Summary:*** "Asian soybean rust is a serious foliage disease that has the potential to cause significant soybean losses. Although Asian soybean rust was identified on soybean plants in Hawaii in 1994, the disease was not reported in the continental United States until the fall of 2004. The USDA released an official notice of the confirmation of soybean rust on soybean leaf samples collected in Louisiana on Nov.

10, 2004. Over the next few weeks the fungus was detected on plants from a number of additional states, including Missouri."

"History: Soybean rust was first reported in the Eastern Hemisphere [Asia] in the early 1900s. It is now accepted that there are two different fungal species, *Phakopsora pachyrhizi* and *Phakopsora meibomiae*, that cause soybean rust. *Phakopsora meibomiae*, referred to as the New World type, is a much weaker pathogen and is the pathogen that has been found in limited areas in the Western Hemisphere (primarily the Caribbean).

"*Phakopsora pachyrhizi*, referred to as the Asian or Australasian soybean rust, is the more aggressive pathogen. It was first reported in Japan in 1902 and was initially limited to tropical and subtropical areas of Asia and Australia. Unfortunately, it is *Phakopsora pachyrhizi* that has been spreading through the soybean-producing regions of the world. *Phakopsora pachyrhizi* was reported from Hawaii in 1994, Zimbabwe in 1998 and Paraguay in 2001. In Africa this aggressive soybean rust has spread to Uganda, Zambia, Rwanda, Nigeria, West Africa, Mozambique, South Africa and Cameroon. In South America, *Phakopsora pachyrhizi* has been found in most of the soybean-producing regions of Brazil as well as Argentina, Bolivia and Colombia." Address: 1. Dep. of Plant Microbiology and Commercial Agriculture Program; 2. Dep. of Plant Microbiology and Pathology, Delta Research Center; 3. Plant Diagnostic Clinic. All: Univ. of Missouri.

1670. Camps, Lisa. 2005. Re: History of work with soyfoods in Goa, India. Letter (e-mail) to William Shurtleff at Soyfoods Center, May 15. 2 p.

• ***Summary:*** 1984–Lisa came to Goa to nurse a friend back to health; he was a vegetarian. While in India she discovered so many alternative styles of life, so many people from all over the world with a similar consciousness related to healthy body, mind, and spirituality. All "seemed to care about the planet, nature, peace, yoga, natural healing, vegetarianism, etc. India is a whole country of vegetarians, but in Goa, a former Portuguese colony, the inhabitants are mostly Christians who eat meat." That year, Lisa became a vegetarian.

She returned to America, only to yearn to come back to India. So she spent 7-8 years coming and going, whenever finances permitted. When in the USA, she worked with food, in restaurants, hotels, night clubs, made good money, then left again. She took many courses in the health and nutrition at community colleges. She had seen many unhealthy vegetarians and wanted to learn how to be a healthy, vigorous vegetarian. Having helped to deliver 4 children by natural child birth in Goa, she was interested vegetarian diets for children and natural healing.

1982–While in Goa, Lisa met an Australian woman, Diane [Froggatt], who was making her own tofu, because it was not available, and all were tired of Dal (lentils). "I asked her to teach me, and she did... I happily made it for myself to fill the protein gap. Along with Tofu also comes Soy Milk and Okara! A bonus! Made soysausage, soya burgers, etc., but only at home at that time."

1986-87–Lisa attended a Michio Kushi Institute in Switzerland; she learned macrobiotics and shiatsu, which she practiced for about a year, then decided that macrobiotics was "excellent for healing purposes, but not for daily life, simply because any diet so extreme and tasteless is doomed to opposite extremes." She observed that most people who regularly ate a macrobiotic diet "craved massive amounts of Chocolate, or some other form of 'naughtiness.'"

1989-90. Lisa decided to settle in Goa. It had really become her home and it was too expensive to fly back and forth. But how to make money in India? Her many Indian women friends adored lingerie. So she did all the necessary paperwork and started a business named Ooh-La-La-Lingerie Pvt. Ltd., importing undergarments from Europe and traveling all over India to sell them to major department stores. The business went well for 2-3 years until the suppliers and buyers connected–leaving her out.

At the same time, Lisa was selling soya burgers, hummus brown bread, and 4 flavors of soy milk in the Flea market [in Anjuna], where she had a food stall; she made these in her home kitchen. "Then a few people started asking me if I could make them some Tofu! So, I thought why not, since I'm doing it for myself anyway." "All our production started in a small room (in my house), which I converted into a special tofu room, with ventilation above a false ceiling, a sink, stainless steel tables, and extreme hygiene. It was about 3 meters on a side with white tiles. We used (and still use) Aqua Guard water filter systems for all production and packing. So I started by making 2-3 kg at a time, squeezing the milk through a cloth by hand, actually burning my hands on a regular basis, until I decided to build a press. Made some wooden tofu boxes, and did the grinding on a grinding stone. Ouch, too much time and labor! We were selling only to shops and Five-Star hotels.

"As time passed and orders got bigger, my friend and now partner, Richard Chabin, helped me get some machinery. Then, I wanted to learn about Tempeh, and how to make it. There was an American fellow named Joseph Papa who had a book and an interest, so I traded him my shiatsu massages for the method on how to make Tempeh. My interest in Tempeh was the vitamin B's only found in Tempeh. Important if you don't eat beef liver.

"So now I knew many soy foods, and was happily cooking for many friends daily. I enjoy cooking, and they enjoyed eating.

"Then I tried to market the tofu to the local market and restaurants, but as they were not familiar with it, they were afraid, even after I gave them many recipes" and even showed them how to prepare it Indian style–like paneer. "That's when I decided to open a small sandwich shop."

1999–The sandwich shop, named Bean Me Up, Soya Station, Salad Bar, was a "raging success from the beginning." It became too big for the original premises, and there were long lines at peak season. Note: The restaurant name derives from a famous catchphrase from the movie *Star Trek*, "Beam Me Up, Scotty!"

2004 Oct. 31–Lisa took on large premises with 14 rooms to rent and a small health food shop and restaurant. The commercial foods (tofu, tempeh, soymilk, etc.) are made in a separate building (a small factory) on the compound. It opened on Halloween with a costume party. The "real point is the restaurant" (which kept the same name); it is a unit of Ooh-La-La Ling. When people discover that they can get fresh safe salads, Tofu, Tempeh, Seitan, soya ice cream, Tofunaise, etc. after traveling in India, they are so Appreciative. That is a reward in itself! I truly believe that to introduce people to a more healthy diet, and to given up meat, the alternative must taste good, or why would they consider changing? Hence, our theme is 'The Tasty Alternative.' Lisa, now an established businesswoman, has a new source of income from her 14-room hotel!

Two months later, on 24 Dec. 2004 (Christmas eve), a mob of 150 people, escorted by two policemen (for the mob's protection!) went to the Anjuna-Chopra beach belt and rudely demanded that certain restaurants and shops close down. Why? Because their owners were of foreign origin. No matter that Lisa, of American origin with an Indian passport, had lived in Goa for 23 years and had all the legal papers required to run her business. The agitation was probably initiated by indigenous restaurant/shop owners who resented the foreigners' success and had the blessings of local politicians–a familiar theme worldwide. Fortunately, Lisa had some friends with the National Press, Times of India, so she and her fellow foreigners showed no fear, followed the procedures, and made a big noise; the actions of the mob were clearly illegal. Her restaurant was never shut down and the problem appears to have gone away.

Lisa is a member of the Vegetarian Society of India, and occasionally they call on her to give seminars for the members.

Note: Diane Frogatt died a few years ago from cancer. Address: Owner, Bean Me Up, 1629 Deulvaddo, Anjuna/ Vagator, Goa, India 403-509. Phone: 0091-(0)832-227349.

1671. Richards, Michael. 2005. Update on work with candles (Interview). *SoyaScan Notes.* Aug. 3. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** "We have a very interesting business here. We sell everywhere from craft ladies coming in for one box to truckloads to other manufacturers." Michael's candle business is going well. He is now exporting to 22 countries, and all of these overseas customers found him using the Internet. "We did not seek any international business. It's a perfect example of Emerson's adage, that if you build a better mousetrap, the world beats a path to your door." He's been on the Internet for so long, that if you do a Google search for "soywax" as one word or "soy wax" or "soybean wax" as two words, the search engine takes you right to his website. He comes up first on the list.

In Germany and Italy he works with companies that are "existing wax distribution entities. They are already in the paraffin wax industry and they have added Michael's wax to their line." Sales are going well in Europe. Italy doubled their order on their second order. His first overseas shipment was in the summer of 2004, when he shipped a full 20-foot container to Rotterdam, the Netherlands; from there it was distributed out to Great Britain, Norway, Guernsey and the Channel Islands. He works with a logistics and forwarding company in Rotterdam. And he has shipped containers to Beijing and Hong Kong. "I'm still attempting to do all the wax business as one person, even though Cargill does all the manufacturing of the wax, which makes that possible." However he now has some people off the street doing some candle production, but on a smaller scale. Last time we talked, the landlord had sold the building in which Candleworks had operated for many years, so he was out of the wax-making business for a while. The equipment has been reinstalled in a new place.

His first customer with the actual candle production is an interesting company, Watkins, which has been around for about 140 years, when they basically invented direct sales, by selling muscle lineaments from wagons door to door to Minnesota farmers. Watkins now manufactures 90% of their own product line, which are mainly medicinals and culinary items (such as vanilla and various spices). They have graduated into the 21st century by direct sales via the Internet. Watkins is very well known in the central Midwest; their headquarters is in Winona, Minnesota, on the Mississippi River. Michael read a history of Watkins. In 1920, they had 20,000 salespeople across the USA–all working on commission and selling door to door. Many farm families have sold Watkins products for 40-50 years as supplemental income. Half of Michael's first shipment to them is going to China. They have realized that the direct selling model is of interest in China. Michael was invited and went to their annual meeting. In China, they are building a high-profile retail shop in Beijing, to establish a presence and develop a brand awareness. Then they will send direct-sales people throughout China–to sell Watkins products door to door.

There months ago Michael started writing a new book about the shift from petrochemical based consumer goods to biobased goods–such as soy candles. Iowa State University is getting deeply involved in researching biobased products;

they have a symposium on that subject next week. The structure will be from the general to the specific. "I'm looking at how the petroleum paradigm came into existence, how so many products developed out of that, and then how and why the biobased shift is beginning to happen." He will have examples of some of the other entrepreneurs he has gotten to know–including a gentleman who works with soy plastics, etc.

"We've fought for our tiny corner here, but it hasn't been easy. Being right here in the middle of very productive farmland, we're in a good place."

Michael's relationship with Cargill is "an interesting paradox. Without that relationship, I would be unable to ship containerloads of soy wax to other countries. But their nature is to maximize their own profits, so I have to be very wary of them at every step along the way. So far, they have kept producing wax from our formula. They did develop C-2, which they then rejected, because customers kept saying it didn't work as well. But now they've moved onto C-3, which they try to sell." They are selling in competition to Michael. Michael can live with it. Sales over the first 4 years of the contract have grown at 10-15% a year. After 2 years, Cargill said they were disappointed in the rate of growth. Last year they told Michael "they were very pleased with the growth rate because they felt it was evidence of a true shift in the industry rather than just a little flash in the pan. They've changed their thinking. But it does teach you patience."

We talk about the switch from animal products to plant products. From whale oil to petroleum. From butter to margarine. From bees wax candles and petroleum candles to soy wax candles. Address: Founder and owner, Candleworks, Inc., 1029 Third St. S.E., Cedar Rapids, Iowa 52401. Phone: 319-363-1774.

1672. Sunstein, Cass R.; Nussbaum, Martha C. 2005. Animal rights: Current debates and new directions. Oxford, England: Oxford University Press. 352 p. *

• ***Summary:*** Contents: Introduction: What Are Animal Rights?, Cass R. Sunstein, University of Chicago.

Part I: Current Debates. 1. Animal Rights, One Step At A Time, Stephen M. Wise, Vermont Law School. 2. Animal Rights: Legal, Philosophical, and Pragmatic Perspectives, Richard A. Posner, Judge of the United States Court of Appeals, Seventh Circuit, and Senior Lecturer at the University of Chicago Law School. 3. Ethics Beyond Species and Beyond Instincts: A Reply to Richard Posner, Peter Singer, Ira W. DeCamp Professor of Bioethics, University Center for Human Values, Princeton University. 4. Eating Meat and Eating People, Cora Diamond, Kenan Professor and University Professor Emerita at the University of Virginia. 5. Taking Animal Interests Seriously, Gary L. Francione, Professor of Law and Nicholas de B. Katzenbach Distinguished Scholar of Law and Philosophy, Rutgers University School of Law-Newark. 6. Animals As Objects, or Subjects, of Rights, Richard A. Epstein, James Parker Hall Distinguished Professor of Law, University of Chicago Law School, Peter and Kirsten Senior Fellow, The Hoover Institution. 7. Drawing Lines, James Rachels, University Professor of Philosophy, University of Alabama at Birmingham. 8. All Animals Are Not Equal: The Interface Between Scientific Knowledge and Legislation for Animal Rights, Lesley J. Rogers and Gisela Kaplan, both Professors of Neuroscience and Animal Behavior at the University of New England, Australia.

Part II: New Directions. 9. Foxes in the Hen House: Animals, Agribusiness, and the Law, David J. Wolfson, senior associate at Milbank, Tweed, Hadley & McCloy LLP, Lecturer in Law Harvard Law School, and adjunct professor at the Benjamin N. Cardozo School of Law and Mariann Sullivan, Deputy Chief Court Attorney at the New York State Appellate Division, First Department, former chair of the animal law committee of the Association of the Bar of the City of New York. 10. A New Property Status for Animals: Equitable Self-Ownership, David Favre: Professor, Michigan State University DCL College of Law. 11. Can Animals Sue?, Cass R. Sunstein, University of Chicago. 12. Of Mice and Men: A Feminist Fragment on Animal Rights, Catharine A. MacKinnon, Elizabeth A. Long Professor of Law, University of Michigan Law School, and long-term visitor, University of Chicago Law School. 13. Animal Rights and the Values of Nonhuman Life, Elizabeth Anderson, Professor of Philosophy and Women's Studies, University of Michigan, Ann Arbor. 14. "Beyond Compassion and Humanity": Justice for Non-Human Animals, Martha C. Nussbaum, University of Chicago.

Brief review: "This is a veritable hitchhiker's guide to the galaxy of animal rights and animal welfare. Anyone genuinely concerned about the creatures who are our kin will have to read this book from cover to cover."–Laurence H. Tribe, Harvard Law School.

1673. Santoso, Sinta; Santoso, Sugeng. 2005. History of Primasoy [Tempeh maker in Australia]. Victoria, Australia. 1 p. Dec. 13.

• ***Summary:*** Both Sinta (a woman) and Sugeng (her husband) were born and raised in Malang, East Java, Indonesia. They grew up in Indonesia, where they enjoyed "Tempe Malang" as a staple food, eaten with meals at least once or twice a week. Sugeng writes: "I could remember as a child I was taken by my father, who spoke fluent English, to accompany an American to visit the tempeh village near Malang to see the tempeh production. This must have been in the sixties. I wonder if it was you."

Sinta graduated as a food chemist from Braunschweig University, Germany, and Sugeng as a process engineer from Cologne, Germany. They migrated to Australia in 1982, and were married there in 1983. They initially opened an Indonesian restaurant in Melbourne, where Sugeng met Michael Manser, the first tempeh maker in Melbourne as far as he knows. Michael has since retired; he never went to Indonesia but made excellent tempeh. After the restaurant, they worked for large companies in their professional fields. Sugeng worked for a big supermarket as a quality officer; he realized that he was not destined to work in the corporate world and began researching the tempeh industry in Australia. He came to the conclusion, after Michael retired, that there was no good quality tempeh on the market; he believes that vacuum packing and the addition of vinegar makes the tempeh brown, chewy, watery, and bitter. "This has damaged the image of tempeh in Australia, and therefore tempeh is not very popular here now. I would really like to do some more research to extend the shelf life of tempeh so I can distribute my product interstate within Australia without using vacuum packaging." They spent months perfecting the method of making Tempe Malang in order to produce a high quality, sellable product.

"There are several tempeh manufacturers in Australia at the moment. The last of these, Nutrisoy, is owned by an Indonesian born operator. Then there are smaller operators such as Tally Ho, and Simply Soy and Blue Lotus in Melbourne. There may be more smaller manufacturers in other states which I am not aware of."

2004 July–They rent a small suburban store, close to their home at 2 Dunoon Court, Mulgrave, Victoria; they convert it into a tempeh manufacturing kitchen. The tempeh is made solely by Sinta and Sugeng.

2005 Feb.–Primasoy has its first public debut at *The Age* 'Harvest Picnic at Hanging Rock,' a food festival designed to promote locally made food and beverages. About 30,000 visitors circle the various food stands. Their tempeh was very well received by the public as a new and exciting product.

2005 March–Following the Harvest Picnic success, Primasoy begins promoting their product in selected organic food shops around Melbourne.

2006 Dec.–Sinta and Sugeng are still making tempeh commercially at Primasoy. "Things are very good. We are still experimenting with the MAP vacuum packaging. Currently we found pasteurization and light vacuum might be the way to go, but we have not yet validated it. We have been busy doing cooking demos lately and have not been concentrating on shelf life extension." They are now writing a book about tempeh. And they will have two new tempeh products early next year: (1) Tempeh with tamari, ginger and sesame oil. (2) Tempeh with roasted garlic and coriander. "Next project will be okara tempeh *(tempe gembus)* and tempeh burger. I have a leaflet with recipes and I will send it to you."

They have lost touch with Mike Manser; last they heard he was planning to move to Tasmania. Address: 2 Dunoon Court, Mulgrave 3170, Victoria, Australia.

1674. **Product Name:** Tonzu Organic Soy Yoghurt (Natural).
Manufacturer's Name: The Organic Soy Company, Ltd.
Manufacturer's Address: Unit A, 2 Corban Ave., Henderson, Waitakere City, Auckland 0612, New Zealand.
Date of Introduction: 2005.
Ingredients: Filtered water, organic soybeans, cultures (incl. L. acidophilus and Bifidus).
Wt/Vol., Packaging, Price: 500 gm.
How Stored: Refrigerate at 2°-4°C.
New Product–Documentation: Label sent by Elizabeth Chalmers, owner. 2007. Jan. 22. The product was introduced by this company in 2005. Self adhesive label. 3¼ by 2¼ inches. Color photo of snowy mountains on deep blue background. Superb label design. GE [Genetically Engineered] Free logo. Certified Organic logo.

1675. Brand-Miller, Jennie; Wolever, Thomas M.S.; Colagiuri, Stephen; Foster-Powell, Kate. 2005. The new glucose revolution: The authoritative guide to the Glycemic Index–The dietary solution for permanent weight loss. Emmaus, Pennsylvania: Rodale Press. xvii + 382 p. Subject index. Recipe index. 24 cm. [32 ref]

• ***Summary:*** Contents: Introduction. Part I: What is the glycemic index? 1. What's wrong with today's diet? 2. Why we all need carbohydrate? 3. All about the glycemic index. 4. Fats: Facts and fallacies. 5. The most frequently asked questions–Answered. Part II: Your guide to low-GI eating. 6. Making the change to a low-GI diet. 7. Cooking the low-GI way. 8. Recipes–Breakfasts, light meals, main meals, desserts, snacks.

Part III: The glycemic index and you. 9. The glycemic index and weight control. 10. The glycemic index and diabetes. 11. The glycemic index and hypoglycemia. 12. The glycemic index and heart health: The insulin resistance syndrome. 13. Children and the glycemic index. 14. The glycemic index and peak sports performance. Part IV: The glycemic index tables. The tables: An introduction and how to use them. Condensed tables. Comprehensive tables. Further reading: Sources and references. Glossary. Acknowledgments. About the authors.

"The right kind of carbohydrate can make an important contribution to the quality of your life." That is the essential message of this book, which is about the glycemic index, a physiologically based measure of carbohydrate quality, and the degree to which the carbohydrates in different foods will raise blood glucose levels. The newer idea of glycemic load is also relevant for everyone. The first book about the glycemic index (GI), titled *The Glucose Revolution* (1996) was written by these same authors. Carbohydrates that break down quickly during digestion have high GI values, and they raise blood glucose rapidly to a high level. Carbohydrates that break down slowly, releasing glucose slowly into the blood stream, have low GI values. Glucose is blood sugar. Low fat diets are automatically high in carbohydrate, But not all carbohydrates are the same. Are all starches good for health? Are all sugars bad? We all must look at carbohydrates in a whole new way!

A healthy diet leads to neither too much nor too little blood sugar. Extreme #1: Too much blood sugar. The typical American diet, which is high in refined carbohydrates (such as table sugar and white flour), results in too much blood sugar. This causes your pancreas to flood your body with the hormone insulin and makes it difficult for your body's cells to burn fat.

Extreme #2. Too little blood sugar. Diets low in carbohydrates cause blood sugars to plunge, which also makes your body stop burning fat. Instead it begins burning muscle tissue and converting it into blood sugar. You quickly begin to crave carbohydrates.

Low GI is less than or equal to 55. Moderate GI is 56-69. High GI is 70+.

Prevention says that "high-GI foods" (those with a GI of 70 or above) are bad. "Forget total carbs; its total GI that matters." There are good carbs (low-GI) and bad carbs. A low-GI diet is generally a healthy diet, a weight loss diet, and a diet with low risk of diabetes. A large and growing body of research now reveals that the real issue isn't how much fat or carbohydrate you are eating, but how that food affects your blood sugar. Eating high-GI foods causes sharp spikes in blood sugar. Since blood sugar is a readily available energy source, your body chooses to burn it as fuel. in place of fat. This means you are not burning fat, no matter how hard you exercise.

The Glycemic Index (GI) is a precise scientific ranking of foods based on how much they increase blood sugar levels during a 2-hour period after eating. Current methods of measuring GI use glucose (blood sugar) as the reference food, giving it a GI value of 100 by definition. The GI was first created as an aid to diabetics.

Low-GI foods: Fruits: Apples 40, banana 51, blueberries 40, cherries 22, grapefruit 25, orange 51. Vegetables: Asparagus, beans (all), broccoli, cabbage, lettuce, mushrooms, onions. Breads: Pumpernickel, rye, sourdough, whole wheat. Dairy products. Eggs. Nuts. Seeds.

Soyfoods are not discussed much in this book since they are low in carbohydrates. However: Recommendation 3 (p. 112-13): "Eat more legumes (beans, peas, and lentils) and use nuts (in small amounts) more frequently." Legumes, including soybeans, are inexpensive, low in calories, free of unsaturated fat and cholesterol, filling. "Soybeans are particularly rich in ALA [alpha-linolenic acid, the plant form of polyunsaturated omega-3 fat] (the plant precursor of omega-3s) and also contain genistein–an anti-cancer phytochemical. Tofu (soy bean curd) is an easy way of using soy. It has a mild flavor itself but absorbs the flavors of other foods, making it delicious when its been marinated in soy sauce, ginger and garlic and tossed in a stir-fry."

The section on the GI values of different food types states, under legumes (p. 129): "Soy beans (GI value of 14-20). These have one of the lowest GI values, possibly due to their higher protein and fat content. Their viscous [soluble] fiber, as in other legumes, reduces physical availability of starch to digestive enzymes."

On p. 329 is a table showing the GI value and glucose load per serving of various soy milks and soy yogurts (mostly from Australia). Similar values are given for soy beans (p. 337).

Concerning ALA (p. 115): "Our bodies can convert this plant-based omega-3 fat to EPA [eicosapentanoic acid, an essential omega-3 fatty acid found in fatty fish and shellfish] and DHA [docosahexanoic acid, another essential omega-3 fatty acid found in fatty fish], but it takes about 10 grams of ALA to yield 1 gram of DHA and EPA."

Is this a weight-loss book that does not mention calories? No, although calories and energy are considered less important than GI (see p. 133, 202, 205). Address: PhD, Prof. of Nutrition, Univ. of Sydney, Australia; 2. MD, PHD, Prof., Dep. of Nutritional Sciences, Univ. of Toronto, Canada.

1676. Knothe, Gerhard; Van Gerpen, Jon Harlan; Krahl, Jurgen. eds. 2005. The biodiesel handbook. Champaign, Illinois: AOCS Press [American Oil Chemists Society]. ix + 302 p. Illust. Index. 24 cm. [793 ref]

• ***Summary:*** Contents: Preface. Introduction: What is biodiesel? 2. The history of vegetable oil-based diesel fuels. 3. The basics of diesel engines and diesel fuels. 4.1. Biodiesel production. 4.2. Alternative feedstocks and technologies for biodiesel production. 5. Analytical methods for biodiesel. 6.1. Cetane numbers. 6.2. Viscosity. 6.3 Cold weather properties and performance of biodiesel. 6.4.1. Oxidation: Literature overview. 6.4.2. Stability of biodiesel. 6.5. Biodiesel lubricity. 6.6. Biodegradability, biological and chemical oxygen demand and toxicity of biodiesel fuels. 6.7. Soybean oil composition for biodiesel. 7.1. Impact of biodiesel fuel on pollutant emissions from diesel engines. 7.2. Influence of biodiesel and different petrodiesel fuels on exhaust emissions and health effects. 8.1. Current status of the biodiesel industry. 8.2 Biodiesel in the European Union: Current status of legislation and production. 8.2.1. Biodiesel quality management: The AGQM story. 8.3. Status of biodiesel in Asia, the Americas, Australia, and South Africa. 8.4. Environmental implications of biodiesel. 8.5. Potential production of biodiesel. 9.1. Other uses of biodiesel. 10.1. Other alternative fuels from vegetable oils. 11.1. Glycerol. Appendixes A, B, and C.

More than half of the above chapters are cited separately with an abstract / summary (which see). Address: 1. NCAUR, ARS / USDA, Peoria, Illinois; 2. Dep. of

Biological and Agricultural Engineering, Univ. of Idaho, Moscow, Idaho; 3. Univ. of Applied Sciences, Coburg, Germany.

1677. Koerbitz, Werner. 2005. Status of biodiesel in Asia, the Americas, Australia, and South Africa. In: G. Knothe, J. Van Gerpen and J. Krahl, eds. 2005. *The Biodiesel Handbook.* Champaign, Illinois: AOCS Press. ix + 302 p. See p. 211-18. [7 ref]

• ***Summary:*** Contents: Introduction. The Americas: Argentina, Brazil, Canada, Nicaragua. South Africa. Australia. Asia: China, India, Japan, Malaysia, Philippines, South Korea, Thailand. Address: Austrian Biofuels Inst., Vienna, Austria.

1678. Altieri, Miguel; Pengue, Walter. 2006. GM soybean: Latin America's new coloniser. *Seedling (Quarterly Newsletter of Genetic Resources Action International, Barcelona, Spain).* Jan. p. 13-17. [17 footnotes]

• ***Summary:*** Contents: Introduction. Soybean deforestation. Forcing small farmers out. Soybean cultivation degrades the soil. Monocultures and ecological vulnerability. Other ecological impacts. A table titled "Global status of biotech crops in 2005," with a world map, states: "21 countries have adopted biotech crops. In 2005, global area of biotech crops reached 90 million hectares, representing an increase of 11% from 2004, equivalent to 9 million hectares. Biotech mega-countries, with 50,000 hectares or more, are (in million ha): USA 49.8. Argentina 17.1. Brazil 9.4. Canada 5.8. China 3.3. Paraguay 1.8. India 1.3. South Africa 0.5. Uruguay 0.3. Australia 0.3. Mexico 0.1. Romania 0.1. Philippines 0.1. Spain 0.1. Those with 50,000 acres or less are Colombia, Iran, Honduras, Portugal, Germany, France, Czech Republic.

A graph shows global area (million hectares) of 4 GM crops (in descending order of acreage in 2005): Soybean, maize, cotton, canola. Address: 1. Prof. of Agroecology, Univ. of California at Berkeley; 2. Prof. of Agriculture and Ecology, Univ. of Buenos Aires, Argentina.

1679. Global Industry Analysts, Inc. (GIA). 2006. Soy foods–Global strategic business report. 5645 Silver Creek Valley Rd., San Jose, California. 302 p. Jan. *

• ***Summary:*** Publisher description: This report analyzes the worldwide markets for Soy Foods in Millions of US$. The specific product segments analyzed are Soy Ingredients, and Soy Oil. The report provides separate comprehensive analytics for the US, Canada, Japan, Europe, Asia-Pacific (excluding Japan), Latin America, and Rest of World. Annual forecasts are provided for each region for the period of 2000 through 2010. The report profiles 151 companies including many key and niche players worldwide such as Archer Daniels Midland Company, Dean Foods Company, White Wave, Eden Foods, Inc., Galaxy Nutritional Foods, Inc., Gardenburger, General Mills, Glenn Foods, Greet Spot (Thailand), Griffith Laboratories (UK), H.J. Heinz Co. Hain Celestial Group, Hartz International (Australia), Hazlewood Grocery (UK), Heartland Fields (USA), Hermans Foods (Australia), High Mark Foods (New Zealand), Imagine Foods, Inc., Kerry Group PLC (Ireland), Kerry Ingredients (Australia), Kikkoman (Japan, Australia, USA, Singapore), Kimlan Foods Co. (Taiwan), Kuhne Nederland BV (Netherlands), Soyaworld, Inc., Turtle Island Foods, Inc., and Vitasoy USA, Inc.

Price: Electronic or hard copy 3,496 euros. Please note: Reports are sold as single-site single-user licenses. The delivery time for hard copies is between 3-5 business days, as each hard copy is custom printed for the organization ordering it. Electronic versions require 24-48 hours as each copy is customized to the client with digital controls and custom watermarks. Address: San Jose, California. Phone: 408-528-9966.

1680. *SoyaScan Notes.*2006. Chronology of the Dutch East India Company (VOC), 1602-1799 (Overview). Feb. 6. Compiled by William Shurtleff of Soyfoods Center.

• ***Summary:*** Throughout the 16th century (1500s), Portugal became fabulously wealthy from its monopoly of the spice trade in the East Indies. Like many commercial advantages of the time, this was achieved by control of sea routes, especially domination of the route to the East Indies via the Cape of Good Hope (at the southern tip of Africa).

A well-organized Protestant church movement developed in the Netherlands, and the dissatisfaction with Catholic Spain coincided with the Protestant revolt against the Roman Catholic Church.

1566–Anti-Catholic riots spread across the Spanish Netherlands. Philip II of Spain sends his troops whose harsh actions result in open revolt.

1568–The 80-year war of independence by the Dutch against Spain begins (ended 1648).

1579–Signing of the Union / Treaty of Utrecht with Spain marks the foundation of the United Provinces. These are the 7 northern Protestant provinces of Holland, Zeeland, Utrecht, Gelderland, Groningen, Friesland, and Overijssel. The 7 provinces that joined the union would eventually become the Netherlands; the 10 southern Catholic provinces that did not would become Belgium.

1581–The Union of Utrecht (United Provinces) declare independence from Spain.

1596–Dutch merchants begin trading with Jayakarta (today's Jakarta).

1600–The Dutch ship *Liefde* is stranded in Usuki Bay, Japan; the first Dutch contact with Japan.

1600–The Honourable East India Company is established in London, Europe's first such international trading company. The Tokugawa shogunate begins in Japan.

1602 March 20–The Dutch East India Company *(Verenigde Oostindische Compagnie, VOC*–literally "United East Indies Company") is established by Dutch merchants, when the Estates-General of the Netherlands granted it a monopoly to conduct trade, business and colonial activities in Asia. It was the world's first company to issue stocks and the first multinational corporation. The VOC eventually became the world's largest company, in existence for over 200 years. It built over 1,600 ships called East Indiamen.

The VOC consisted of 6 Chambers *(Kamers)* in Amsterdam (with 8 delegates), Middelburg (for Zeeland: 4 delegates), plus Enkhuizen, Delft, Hoorn, and Rotterdam (1 delegate each). Delegates of these chambers convened as the *Heeren XVII* (the Lords Seventeen). Because of its majority 8 delegates, the Amsterdam bloc basically decided policy. The start-up capital was 6.4 million Gulden, raised by the 8 chambers, of which 27% came from Amsterdam. This capital was raised by selling VOC stock to 1,143 subscribers.

1603 Dec. 18–The first VOC fleet of 12 ships sails under the command of Steven vander Hagen.

1605–VOC first lands in Asia. Armed Dutch merchantmen capture the Portuguese fort at Ambon (Amboyna / Amboina, a town and island in the Moluccas, in today's eastern Indonesia) and take control of the island which was the most important of the Moluccas (Spice Islands) at this time. The Portuguese had established a factory here in 1521; it was the source of their clove monopoly. This fort is developed in the VOC's first secure fort. Ambon was the headquarters of the VOC from 1610 to 1619 until the founding of Batavia (now Jakarta) by the Dutch.

1609–VOC factory (comptoir, trading post) established on site of Jacatra / Jakatra (today's Jakarta) by Dutch merchant Jan Pieterszoon Coen. Located at the far western end of the island of Java, it becomes the headquarters of the Dutch East India Company, which gradually extends control over neighboring sultanates and principalities.

1609–First VOC factory (trading post) in Japan established on the island of Hirado (Por. Firando), off Japan's southernmost island of Kyushu (northwest of Nagasaki).

1609–Twelve Years' Truce, signed in Antwerp, calls a halt to hostilities between Spain and the Seventeen Provinces.

1610–Small walled town of Paliacatta (also spelled Paliacatte; today's Pulicat) established on the east coast of southern India. It soon becomes the chief Dutch settlement and headquarters of the VOC factories on the Coromandel Coast. At its center is Fort Geldria, with its permanent garrison of Dutch soldiers, its cannon and armory to protect the various Company trading posts along the Coromandel Coast.

1612–Fort established on Ceylon (today's Sri Lanka).

1613–As early as this year, VOC leaders recognize the importance of direct trade with China. However attempts to establish a settlement on the Chinese coast in the early 1600s are not successful.

1615–Powerful Dutch merchant Isaac Le Maire tries to break the VOC monopoly on trade routes to the Indies by sailing westward through dangerous and uncharted waters around Cape Horn, the southernmost tip of South America and into the Pacific Ocean, avoiding the VOC-controlled Straits of Magellan. The ship arrived in Jakarta in Oct. 1616, to the amazement of Governor-General Jan Coen.

1616–Danish East India Company founded.

1619–The Dutch attack and destroy Jayakarta (Jakarta, Jacatra). East of the ruins they build a new coastal town, which Coen names Batavia (essentially he renamed Jayakarta). Batavia becomes the headquarters of the VOC and of Dutch colonial power in Asia for almost 350 years.

1621–Banda Islands (in today's south central Moluccas, Indonesia) conquered by the VOC, which establishes its monopoly over nutmeg and mace there.

1621–Dutch West India Company founded. In 1624 this Dutch West India company establishes a settlement in New Amsterdam (now Manhattan, New York).

1622–VOC attack on the Portuguese in Macao / Macau fails.

1624–Chinese armies drive the VOC from the Pescadores Islands. A fortified settlement on Formosa (Taiwan) becomes VOC's base for trade with China until 1662.

1633–St. Helena island in the South Atlantic Ocean becomes a supply station.

1635–The Portuguese blockade Malacca (until 1640).

1638–Goa (capital of Portuguese India) blockaded by Dutch fleets (until 1644).

1638–Beginning of VOC's conquest of the coast of Ceylon near Kandy.

1639–The Portuguese are expelled from Japan by the shogun.

1641–The Dutch put a blockade on Melaca / Malacca (the city in today's Malaysia that controls the crucial Straits of Malacca) then seize the city from the Portuguese after 6 months. They keep this hold on Melaka for the next 150 years.

1641–The VOC trading post on Hirado (closed in 1640 by the shogun) is moved to the tiny artificial island of Deshima in Nagasaki Bay, where the men are kept as virtual prisoners (with more severe restrictions than before Shimabara Revolt and the seclusion *[sakoku]* of Japan in 1641) and allowed only one trading ship a year. The Dutch are the only Europeans allowed to trade with Japan for the next 200 years–until 1853.

1648–Treaty of Muenster ends the 80-years' war; Spain recognizes the sovereignty of the Dutch Republic, which is now the foremost commercial and maritime power in Europe, and Amsterdam is the financial center of the continent.

1651–Repeat of the war with Portugal in the Indies–in Ceylon and on the Malabar Coast of southwest India.

1652–Jan van Riebeeck establishes a supply station at Table Bay, the first European settlement near the Cape of Good Hope (on the southern tip of today's South Africa). This post later became a full-fledged Dutch colony, the Cape Colony.

1652-54–First English-Dutch sea war.

1658–Dutch replace Portuguese in Sinhalese kingdom (Ceylon) as the occupying power.

1661–Beginning of the definitive campaign (completed in 1663) to drive the Portuguese out of the Malabar Coast and to control their production of pepper.

During the 1600s (17th century), British and Dutch traders became bitter rivals in international commerce.

1662–VOC is driven out of Formosa / Taiwan by Ming Chinese troops under the command of Cheng Ch'eng-Kung, known to Europeans as Koxinga. In 1684 Manchu troops occupy Formosa.

1664–French East India Company founded.

1665-67–Second English-Dutch sea war.

1667–Dutch seize town of Macassar (Ujung Pandung) and develop trade monopoly in Makassar Strait (in today's Indonesia between East Borneo and West Sulawesi).

1667–VOC takes trading post at Achem (Aceh), the native kingdom of Sumatra.

1669–The VOC is now the richest private company the world has ever seen, with over 150 merchant ships, 40 warships, 50,000 employees, a private army of 10,000 soldiers, and a dividend payment of 40%. By now, the company is in almost constant conflict with the English. Moreover, the VOC has now grown to become a state within a state.

1682–Dutch seize Bantam in West Java. VOC outposts were also established in Persia (today's Iran), Bengal (now Bangladesh), Siam (now Thailand), and mainland China (Canton).

Dutch policy encourages monoculture of the fine spices they controlled: Amboyna for cloves, Timor for sandalwood, the Banda Islands for mace and nutmeg, and Ceylon for cinnamon.

During the 17th century, the VOC was the most important European company in the Asia trade, and Amsterdam became Europe's most important market. It took a Dutch ship 3 to 6 months to travel from Holland to Batavia. The trip was risky, in part because of the inherent dangers of bad weather and uncertain navigation, but also because no reliable method of determining longitude was discovered until the 1770s (by John Harrison in England) and measures to prevent scurvy (carrying fresh fruit, vegetables, and sauerkraut) were not put in place until the period 1772-1795.

The 17th century has been called the Dutch Golden Age, in which Dutch trade, science, and art were among the most acclaimed in the world. This Golden Age was caused by wealth, tolerance, and a new national consciousness.

1731–The Swedish East India Company founded.

1780-1784–Fourth war between the United Provinces and England; England wins, capturing many VOC ships and imposing peace terms that enabled it to trade without hindrance from the VOC and to take over key VOC settlements in Asia After this war, the VOC is in deep financial trouble.

1799 Dec. 31–The bankrupt Dutch East India Company is nationalized, dissolved and liquidated; its huge debt of 219 million Dutch guilders and all of its property are taken over by the Dutch government.

1681. Gupta, Raj. 2006. New developments at ProSoya in the USA and Canada (Interview). *SoyaScan Notes.* May 30. Conducted by William Shurtleff of Soyfoods Center.

• ***Summary:*** "ProSoya" is the popular name of Raj's company. ProSoya Corporation in Heuvelton, New York state is not a new entity. ProSoya Corporation has long existed as a holding / parent company, based in St. Louis, Missouri. The one in New York is a branch of that. The ProSoya UK Ltd. in Livingston, Scotland, which was a separate entity under license from ProSoya Inc., no longer exists. ProSoya Foods India Pty. Ltd. is now active in India.

ProSoya Corp. in Heuvelton is now shipping "soy extract" [soybase / soya base] to a company in Canada. They have also developed a delicious "creamy orange" soymilk with a thick consistency like a smoothie–but it is not yet for sale. Supermarkets that have their own brand of soymilk do not buy soyabase; they want a finished product delivered to their door in their package. Last year Raj could not find a co-packer; but now he has found one in Toronto that packs about 3 truckloads a day for him. He is still looking for one in the USA. If he had been able to find one a year ago, he would be in almost every store by now.

SoyaWorld is now very strong everywhere except in the USA; they have the best-selling soymilk brands in Canada. Since about 2001-2002 they have been owned by Sanitarium Foods of Australia. Originally SoyaWorld was owned by Dairyworld, which was sold to Saputo, then Saputo sold the soymilk business to Sanitarium Foods. Sanitarium kept "SoyaWorld" as a name for both the business and the brand. They don't want to call it Sanitarium, which is sort of an outdated, old-fashioned funny name. SoyaWorld no longer has royalty or exclusivity agreements with ProSoya (they expired in May 2004), which is why ProSoya can now make and sell soybase, soymilk, and soymilk products.

Raj's soybase is now made by an improved process. It is still made by the basic airless cold-grind process, so that change is more in the art than in the science–it is not a breakthrough, but a fiddling with details. He has not licensed his process to anyone. It is better for formulation, is more bland, and is unique in that it has no soy taste. Raj likes to say that his soybase has "no soy taste" and "no beany taste." Most good manufacturers have be able to get rid of the "beany taste, which is normally associated with rancid oil-like flavors, chalkiness, and astringency," but Raj believes that only his company has been able to also get rid of the "soy taste," which is more subtle yet still a big obstacle to widespread acceptance of soyfoods and soy beverages. When Raj talks to big distributors, they say that all the soyfoods manufacturers claim to have gotten rid of the "beany taste," yet the taste still leaves something to be desired–"it still tastes like soy." So Raj speaks of "no soy taste" to distinguish his products from the others. Raj has found that the people of India "hate soy taste." But they love his products, which have no soy taste. Certain flavors go very, very well with his soybase. If a company uses strong flavors or heavy masking, consumers say the product tastes like medicine.

One interesting phenomenon is that the flavor of soybase or soymilk improves as it is allowed to age for 4-5 days.

Raj is not sure whether or not he should put the word "soy" on the package or not. Address: President and CEO, ProSoya Inc., 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. Phone: 613-745-9115.

1682. *Indonesian Newsletter (Melbourne, Australia).*2006. Old and new a delicious combination: Primasoy. 16(4):7. May.
• ***Summary:*** The article begins: "Who would ever have imagined that in the quiet Melbourne suburbs the application of modern technology to an age-old tradition would produce premium quality (and mouthwatering) results?" There Mrs. Sinta Santoso of Primasoy is making "the finest quality organic tempeh products from Australian organically grown soybeans." Describes how the tempeh is made, without vinegar. Gives recipes for Tempeh curry and Tempeh salad. Photos show both dishes and the front of the Primasoy Organic Tempeh label. Note: This newsletter is published by the consulate general of the Republic of Indonesia, Melbourne.

1683. Pfeil, B.E.; Craven, L.A.; Brown, A.H.D.; Murray, B.G.; Doyle, J.J. 2006. Three new species of northern Australia *Glycine* (Fabaceae: Phaseolae), *G. gracei, G. montis-douglas,* and *G. sydetika. Australian Systematic Botany* 19(3):245-58. June 30. [34 ref]
Address: 1, 5. Dep. of Plant Biology, 228 Plant Science Bldg., Cornell Univ., Ithaca, NY 14853.

1684. Hymowitz, Ted. 2006. Ted has decided not to write a book on the history of the soybean (Interview). *SoyaScan Notes.* Sept. 1. Conducted by William Shurtleff of Soyfoods Center.
• ***Summary:*** Several years ago, Ted's plan was to write two books after he retired: (1) A biography of Samuel Bowen, and (2) A history of the soybean, with emphasis on its early history. Now, after he finishes work on the Bowen biography, he plans to write a book about his travels as a plant explorer, largely collecting soybean germplasm in Asia and Oceania. The first chapter of the Bowen biography, to be titled "Western knowledge of the soybean from Marco Polo to Linnaeus," will contain basically everything Ted knows about that subject, including the movement of soy from the Old World to the New World. Address: Prof. of Plant Genetics (retired), Dep. of Crop Sciences, Univ. of Illinois, Urbana, Illinois.

1685. Vitasoy International Holdings Ltd. 2006. Interim report 2006. New Territories, Hong Kong. 40 p. Nov. 30 cm. [Eng; Chi]
• ***Summary:*** For the six months ended 30 Sept. 2006, group turnover (sales) was HK$1,326 million, up 5.1% over the same period last year. Gross profit was HK$779 million, up 5.0% over the same period last year. "In view of the Group's strong balance sheet, the Board of Directors has declared an interim dividend of HK$2.8 cents per share." Sales performance was very encouraging in Mainland China (53.8%) and Australia and New Zealand (12.5%); it was steady in Hong Kong (5.9%), but lacklustre in North America (0.5%).

Market performance in North America: After years of rapid growth, the U.S. soyfoods market overall has begun to shrink. For the first 6 months of fiscal 2006/07 the tofu category decreased by 2.2% and aseptic soymilk by 1.8%. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1686. Triple "F", Inc. 2006? Proud of our past: Focused on our future (Brochure). Des Moines, Iowa. 3 panels each side. Front and back. Each panel: 28 x 15 cm. Undated.
• ***Summary:*** This company was founded "half a century ago." It has three divisions. Contents: Insta-Pro International (extrusion, extraction, oil refining). PharmTech International. Soy Innovations International (develops and manufactures soy proteins). Experience. Global reach. Top talent. Technical innovation. Contact information for 6 companies is given on the back panel, including Insta-Pro Europe (Bristol, UK), Insta-Pro Asia (Taipei, Taiwan), Insta-Pro CIS (Stavrapol, Russia). Triple "F" / Insta-Pro Mexico (Guadalajara). Insta-Pro Australia (Brisbane, Queensland). Address: 10104 Douglas Ave., Des Moines, Iowa 50322]. Phone: (515) 254-1200.

1687. Chalmers, Elizabeth. 2007. Business history of the Chalmers family: Making soyfoods in New Zealand (Interview). *SoyaScan Notes.* Jan. 16. Conducted by William Shurtleff of Soyinfo Center.

• ***Summary:*** At Easter 1980 Rick & Elizabeth Chalmers, together with Rick's brother Greg (his formal name is "Stephen"), opened Harvest Wholefoods, 403 Richmond Road, Grey Lynn, Auckland. They borrowed the money from Elizabeth's mother, and were all equal owners. It was New Zealand's first wholefoods / natural foods store as well as the country's first macrobiotic foods retail store. They were idealists and purists, refusing to sell any vitamins, or minerals, or dairy products.

They started the store partly as a result of becoming interested in macrobiotics, and partly because Elizabeth and Rick had a 3 year old son (Daniel) who could not tolerate dairy products. As the Chalmers could not get the food they wanted anywhere, they thought that they would open a shop to also provide it to others. Moreover, Greg, who had been overseas in London (where he had worked in a restaurant) and the USA, was a pioneer in bringing macrobiotics to New Zealand. "He brought home miso and some seaweeds–foods we had never seen before."

After about six months, in Oct. 1980, in order to attract customers to the shop, they started to make nigari tofu (for their own store only) in a small room at the back of the store, designated just for that purpose. They made the simple equipment themselves, and they learned the process from *The Book of Tofu*, by Shurtleff and Aoyagi.

After another six months they were inundated with other store owners, and cafe & restaurant owners from all over New Zealand wanting to buy their tofu. "It was just amazing." The tofu was completely unpackaged and they sold under water it in bulk buckets only. So in about April 1981 they started to sell their tofu outside of Harvest Whole Foods. "Sometimes they would pick it up, and sometimes we would deliver it."

Sanitarium Health Food Co. was making many kinds of breakfast cereals and canned nut meats, but no soyfoods. Several Chinese restaurants were making tofu (they called it "bean curd"), but only for use in their own restaurants; they did not sell it elsewhere. One of these was named Sun Sun, located in Khyber Pass, Auckland.

Their daughter, Jesse, was born on 1st October 1981, and by this time it was becoming difficult to manage both the shop and making tofu. So they sold the shop and with the capital gained they brought in special tofu making equipment from Japan, moved to new premises at 1 Wallingford St., Auckland, and started Harvest Soyfoods. Harvest Whole Foods is still at its same original location today; it is going strong and doing well financially.

Harvest Soyfoods' first product was nigari tofu; to this they soon added Tofu Spreads (Feb. 1981) then Tempeh (April 1981). The business grew very rapidly, and during this period Greg also had a child, so they all had very young children and were trying to manage their lives as well as an extremely rapidly increasing business.

Greg's partner decided that she wanted to leave Auckland, and as they could not picture another partner in his place and were feeling very overloaded anyway they decided in 1983 to sell the business to Paul and Trevor Johnston, who renamed it Bean Supreme. The Johnstons paid half the money at the time of sale and the remainder a year later; Elizabeth and Rick Chalmers worked for the Johnstons during that year. This business is also still in existence, although it was bought out by Sanitarium Health Food Co. in about Aug. 1986. Note: Trevor is no longer with the company; Paul sold the company to Sanitarium Health Foods.

From 1983 to 1986 Rick and Elizabeth had a commercial cleaning business, which suited the family structure very well, but was very unsatisfying workwise and environmentally.

In about 1980 or 1981 Austin Holden had started a largely macrobiotic import and wholesale business, Kiaora Naturals, at 374 West Coast Road, Glen Eden, in west Auckland. Holden soon started a very small shop in the corner of his warehouse and called it East West Wholefoods. For the first few years, his only customer was Harvest Wholefoods. "We kept him going."

Then in 1986 Rick and Elizabeth started East West Organics, taking over the building (and business) formerly occupied by Austin Holden and Kiaora Naturals. They knocked out all the walls, resulting in a much larger shop that specialised in organic food, with a big emphasis on fruit and vegetables.

They had no intention of making soyfoods. However there was suddenly an influx of Asian immigrants to New Zealand and Asian Tofu (usually made with calcium sulfate in aluminum pots) became widely available. By this time organics was really growing in New Zealand. Elizabeth and Rick wanted to stock organic tofu in their store, but they couldn't find a source. They talked with Trevor and Paul Johnston about making it for them, but the brothers felt there was no future in it, so they declined to do it.

So in 1996 Elizabeth and Rick started The Organic Soy Company, again in a small food factory out the back of East West Organics. They started making nigari tofu again–for their own store only. For the first time, they started to use organic soybeans, and as many other organic ingredients as they needed and could get. "We were right back where we started. And then exactly the same thing happened again. Once the word got out that organic nigari tofu was available again, people started coming from everywhere to buy it. It was not our intention to get back into the soyfoods business; we'd already sold our company. But we wanted the quality, so we had to make it ourselves." East West Organics is still operating today, although out of new premises (outgrew old one), and has just moved up the road slightly.

Their son Daniel joined them in January 1998, and in October of 1998, they sold East West Organics and moved the Organic Soy Company to their current premises at Unit A, 2 Corban Avenue, Henderson, Auckland.

Elizabeth and Rick separated the same year, but continued on in the family business together. In 2001 their daughter Jesse returned from Europe and also joined us in the business. Later that same year Rick left the business to go to University and currently, Elizabeth, Daniel and Jesse are in joint ownership, with Rick still having a 10% share. They started using the brand names (the first being Tonzu) in 2002.

The business is growing slowly, currently producing tofu, tempeh, soy yoghurt, tofu burgers and teriyaki sauce, all 100% organic. Elizabeth has moved to part time as the younger generation are taking on the responsibility for the business. They currently have 3 full time employees as well as themselves, so are still reasonably small.

"We see a great future for the business and will probably outgrow our current premises within the next few years. We love making traditional soy products, and eventually hope to make miso and tamari, which will be export products as well as for the domestic market."

First sold commercially by the organic soy company: Tofu (1996), Teriyaki Tofu (1999), Tempeh (1999), Tofu Burgers (2001), Teriyaki sauce (2003).

All current labels and packaging are new, and have changed very much from the original. They once made two tofu spreads, one teriyaki and the other curry flavour. However it was hard to get a good enough shelf life out of them to make them viable, so reluctantly they discontinued them. They have also changed their burgers significantly. When they first produced a burger in 2001, they had 3 varieties: Garlic and Cheese, Sundried Tomato, and Feta, and Vegan. They have discontinued them all and now just make one that is actually Vegan, although they do not call it that. The burgers did not sell well; they are not certain why that was, maybe they were too expensive with all the organic ingredients and very labour intensive. So they have simplified and streamlined our current burger making the whole process more viable.

As the population of the whole of New Zealand is around 4 million and only 15% of them are vegetarian, they are playing to quite a small market, this can sometimes be quite a challenge. In the long term it will be sensible to develop products that they can export. Address: Founder and owner, The Organic Soy Company, Ltd., Unit A, 2 Corban Ave., Henderson, Waitakere, Auckland 0612, New Zealand. Phone: +64 9 835 3617.

1688. Johnston, Paul. 2007. Re: Bean Supreme–Sale to Sanitarium Foods. Letter (e-mail) to William Shurtleff at Soyinfo Center, Feb. 7. 1 p.

• ***Summary:*** In 1999 Paul sold his very successful soy ice cream, brand-named "LiteLicks" to "Movenpick" in New Zealand.

In Feb. 2006, Paul sold Bean Supreme to "Lisa's Healthy Foods Ltd." (which is owned by the Seventh-day Adventist Church of New Zealand, as is Sanitarium Foods). He remains on a 3-year management contract. The sale has enabled Bean Supreme to pursue a broad new product development plan and to commission a new mid-sized tofu plant from Takai in Japan. "Our intention is to double the sales of vegetarian chilled products in New Zealand and from our year together we are well above target, so some export to Australia will follow in late 2007." Address: New Zealand.

1689. Van Gerpen, Jon H.; Peterson, Charles L.; Goering, Carroll E. 2007. Biodiesel: An alternative fuel for compression ignition engines: Biodiesel historical milestones. *ASABE Distinguished Lecture Series (St. Joseph, Michigan)* Tractor Design No. 31. 22 p. Presented at the Agricultural Equipment Technology Conference, 11-14 Feb. 2007, Louisville, Kentucky, USA. [119 ref]

• ***Summary:*** An excellent table (reprinted with permission, p. 5), titled "Biodiesel historical milestones" states. "1900–Diesel engine demonstrated on peanut oil at the Paris Exhibition.

1912–Rudolph Diesel suggests use of vegetable oils may be important for fuel.

1937–Belgian Patent 422,877 granted to G. Chavanne for using esters of vegetable oils as motor fuels.

1938–Urban bus fueled with esters of palm oils operates between Brussels and Leuven.

1938–Walton reports on 'The Fuel Possibilities of Vegetable Oils.'

1942–Seddon paper on 'Vegetable Oils in Commercial Vehicles.'

1942–Chowhurry et al. report on Indian vegetable oil as fuels for diesel engines.

1947–Chang and Wan report on using tung oil for motor fuel in China.

1951-1952–Two theses at Ohio State University, 'Dual Fuel for Diesel Engines Using Cottonseed Oil with Variable Injection Timing' and 'Dual Fuel for Diesel Engines Using Corn Oil with Variable Injection Timing.'

1980–Bruwer et al. from South Africa report on utilization of sunflower seed oil as a renewable fuel for diesel engines includes tests with esters of sunflower oils.

1981–North Dakota 'Flower Power' project begins.

1984–Wagner, Clark, and Schrock article 'Effects of Soybean Oil Esters on the Performance, Lubricating Oil and Wear of Diesel Engines' and Geyer, Jacobus, and Lestz article 'Comparison of Diesel Engine Performance and Emissions from Neat and Transesterified Vegetable Oils.'

1984–Bio-Energy (Australia) Pty. Ltd. advertises equipment for producing 'Bio-Diesel.'

1988–Wang (China) article on 'Development of Biodiesel Fuel.'

1991–Worgetter describes 'Project Biodiesel.'

1991–Freiberg, 'The Truth About Biodiesel–An Opportunity for Entrepreneurs' published in *Ag Biotechnology News*.

1992–National Soydiesel Development Board (NSDB) organized.

1994–NSDB becomes the National Biodiesel Board (NBB).

1994–University of Idaho completes coast-to-coast and back onroad test with 100% biodiesel fueling a Cummins-powered Dodge pickup.

1994–Conference on 'Commercialization of Biodiesel: Establishment of Engine Warranties' sponsored by the University of Idaho, Moscow, Idaho.

1995–Yellowstone National Park Biodiesel Project begins.

1996–Conference on 'Commercialization of Biodiesel: Environmental and Health Effects' at Mammoth Hot Springs, Yellowstone National Park.

1997–Conference on 'Commercialization of Biodiesel: Producing a Quality Fuel' at Boise, Idaho.

1998–Beginning of Kenworth / Caterpillar Simplot 200,000-mile test with HySEE biodiesel in a heavy-duty truck.

1998–CCC buy-down program for producers of biodiesel.

1999–Biodiesel production surpasses 0.5 million gallons.

2000–Biodiesel passed Tier 2 health effects testing requirements of the Clean Air Act through efforts of NBB.

2000–Biodiesel production surpasses 2 million gallons.

2002–ASTM Standard D-6751 for Biodiesel approved.

2004–American Jobs Creation Act provides a federal subsidy of $1 per gallon for biodiesel fuels made from virgin oils and $0.50 per gallon for other biodiesel fuels.

2006–Two billion gallons of biodiesel production capacity in the U.S. either completed or under construction." Address: 1. Dep. of Biological and Agricultural Engineering; 2. Prof. Emeritus. Both: Univ. of Idaho; 3. Prof. Emeritus, Univ. of Illinois.

1690. Ayres, Bill. 2007. Pioneering Interchem Industries and the commercial production of soy biodiesel in the USA. Part III (Interview). *SoyaScan Notes*. March 8. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** Continued: Bill, Doug, and Kenlon then started a big project: they went to five large cities with urban transit and air quality problems–Cincinnati, Ohio; Chicago, Illinois; Oakland, California; Baltimore, Maryland; and St. Louis, Missouri. The project called for 1 million vehicle miles using soy diesel. Unfortunately, many of the heads of these transit authorities had never heard of soy diesel before. But they were offered a 20% soy diesel blend in their tank. The basic pitch was: "We'll allow you to comply with the Clean Air Act without changing anything but the fuel. "We charged them the same price they would be paying for diesel fuel. They loved it. The NSDB was making up the difference." By that time Bill and Doug also had soy diesel in buses in Sioux Falls, South Dakota; Cedar Rapids, Iowa; Berkeley, Calif., etc. They also did 250,000 mile tests in 20-30 smaller cities, and 50,000 mile tests in 50 smaller cities. They accomplished all of this in less than 18 months (early 1992 to mid-1992). The results were superb. One of their best supporters was Dick Lyle of Bi-State; he explained to the heads of the new transit authorities was a great fuel soy diesel was. By this time, large vehicles had run about 10 million miles on the road on soy diesel with good results.

Booze-Allen did a study showing that soy diesel was the "least cost compliance mile option for the transit people." Then EPA (under President Clinton) changed the regulations concerning how the transit authorities could comply; it required that old engines be built to state of the art, which reduced undesirable emissions–but it hurt our bus market badly. "I don't think there has been a major piece of renewable fuels or alternative fuels legislation ever passed under a Democratic administration." During this time the money Bill needed to live on came from Interchem.

That reminds Bill of a story. It was 1991, before the Sunrider expedition, and before the National SoyDiesel Development Board (NSDB) and the National Biodiesel Board. It was basically Bill and Kenlon Johannes (executive director of the Missouri Soybean Merchandising Council, MSMC) working together on a shoestring. One day Bill got a 30-page fax from Kenlon; it was a 30-page proposal by Bryan Peterson about Sunrider. It was a good, solid, creative proposal. Bryan had learned about biodiesel from what was happening with it in Europe. Somehow he located Kenlon. Bryan had had the project pretty well funded, except he had no fuel of living expenses. Bryan stopped at many places around the world and at every stop he did educational work, promoting renewable energy, including solar and wind, as well as biodiesel. He ran on 100% biodiesel the whole way.

Kenlon asked Bill to give a presentation to the board of directors of the MSMC. Bill looked at Sunrider as completely a public relations project. The whole concept of biodiesel was pretty new to these board members.

This was the first time Bill had met Bryan Peterson. Bryan needed work done on the old pickup truck with which he was pulling the boat. So Bill paid to get his transmission fixed, then put the bill on his credit card. Bill was not getting paid at this time. But they kind of limped along, they got Peterson going, Missouri started funding his boat project, but he still needed living expenses. Eventually, the Sunrider project was handed off to the United Soybean Board (USB), then they funded a big chunk of it. Bill and Kenlon started to get criticized because the project was getting astronomically expensive. Bill would put soy biodiesel into 55 gallon drums than ship it to places like Fiji. Some people also made fun of the expedition. But when he came back, Bryan and the Sunrider became a big thing. For several months he and the boat were the feature at the entrance to Epcot Center, the Walt Disney World Resort in Orlando, Florida.

They continued in this new way until they hooked up with AGP and they installed their plant in Sergeant Bluff, Iowa. In about 1991 the owners changed the company name to Interchem Environmental when they did a reverse split and it became a penny stock (they went public). This had to do with gasification, not with biodiesel. At the time they changed the name, they also established Midwest Biofuels (to market biodiesel made by Procter & Gamble) as a 100% owned subsidiary.

1992 May–The National Soy Fuels Advisory Committee is formed by Kenlon and his counterparts in Missouri, Iowa, Illinois, and South Dakota. Bill Ayres supplied fuel to all of these states.

An interesting web of ties spreads out from Bill's involvement with soy biodiesel. When Tom Reed came back, for a second time, through Kansas City, Missouri, Bill set up a meeting with a company named Stratco Engineering, a small chemical engineering firm. Steve Howell, who worked for Stratco, got involved at that time. He had never heard the word "biodiesel." He now owns a company named Marc-IV and is now the top technical man in charge of research for the National Biodiesel Board. Ray Bitzer left P&G several years later and ended up being the head of a company named Peter Cremer North America in Cincinnati, Ohio. They are now one of the major Biodiesel sales companies; they sell Nexsol brand biodiesel. Bitzer gets his methyl esters from P&G's plant in Cincinnati. Bill helped Gene Gebolys, founder, president and CEO of World Energy (in Quincy, Massachusetts) to make the decision in 1994 to get into the biodiesel business. The Renewable Energy Group in Ralston, Iowa, was a sort of spin-off from Interchem; Gary Hare was involved. If you look at the market and who is selling biodiesel in the USA, Bill has been directly involved with about 75% of the production.

1994 Sept. 2–The Sunrider expedition, headed by Bryan Peterson, arrives in San Francisco, completing its round-the-world voyage. Bill recalls saying: "The news is not going around the world; the big story is when he completes the trip and gets back, showing that he was able to successfully take a boat around the world running on soy biodiesel." Brian ran into pirates and had many other adventures, with all kinds of good stories which generated great publicity for biodiesel.

1996 Sept.–West Central Co-op begins producing biodiesel in Ralston, Iowa [before AGP]. They became West Central Soy and Renewable Energy Group, Inc. The latter is a three-way joint venture between West Central Co-op (one of the largest owners of AGP), Crown Iron Works, and Todd and Sergeant (a large engineering Co.).

But the first maker of commercial soy biodiesel was Interchem, even though they made it in small batch quantities and even though they are no longer in existence. The 2nd producer was Procter & Gamble's plant. AGP likes to say that they were the first, but they really weren't. Address: Ag Bio Energy LLC, Kansas City, Missouri.

1691. Gupta, Raj. 2007. The purchase of SoyaWorld by Sanitarium Foods (Interview). *SoyaScan Notes.* July 24. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** SoyaWorld is now completely owned by Sanitarium Foods of Australia. First Sanitarium bought the 47% of SoyaWorld owned by Sunrise Soya Foods. Later they bought the remaining 53% owned by Saputo. The person who knows the exact dates is Maheb Nathoo, who is still president of SoyaWorld.

SoyaWorld still makes two soymilk products: (1) Soy Good, made from soy protein isolates, is made using the formula developed by Sanitarium Foods. It is very heavily promoted in Canada, using both TV and print, and has about 60% of the Canadian market, but because it is so heavily promoted and costs more to make, Raj thinks that it is presently not as profitable as the other product, So Nice. (2) So Nice is made from whole soybeans, using the ProSoya process. It is never promoted or advertised by Sanitarium Foods. It has about 40% of the Canadian market.

The fact that So Nice is outsold by So Good no longer effects Raj's income, because the exclusive agreement between ProSoya and SoyaWorld (from which ProSoya earned royalties) has expired. SoyaWorld now has non-exclusive use of the process and ProSoya does not get any royalties.

It is difficult to do blind taste tests comparing these two products, in part because so many people already have developed. There are also issues about using another person's branded product in a taste test and publicizing the results. Address: President and CEO, ProSoya Inc., 2-5350 Canotek Road, Ottawa, ONT, K1J 9N5, Canada. Phone: 613-745-9115.

1692. Joe, Peter. 2007. Sale of Sunrise's share of SoyaWorld Inc. and starting a new tofu plant in Toronto, Canada (Interview). *SoyaScan Notes.* July 24. Conducted by William Shurtleff of Soyinfo Center.
• ***Summary:*** In Dec. 2000 Peter Joe sold his 47% share of SoyaWorld to Sanitarium Foods of Australia.

He recently built a new tofu manufacturing plant in Toronto, Ontario. It began production in March 2002. All is well for Peter and Sunrise. The market for tofu in Canada is growing. Address: General Manager, Sunrise Soya Foods, 729 Powell St., Vancouver, BC, V6A 1H5 Canada.

1693. James, Andrew. 2007. Edamame soybean development in Australia. Barton, A.C.T., Australia; Rural Industries Research and Development Corporation (RIRDC), No. 07/130. vii + 13 p. July. Illust. 30 cm. *

1694. Messina, Mark. 2007. International symposium on soy meets in Thailand. *Soy Connection* 15(3):1-3. Summer.
• ***Summary:*** "The 7th International Symposium on the Role of Soy in Health and Disease Prevention was held in Bangkok in March, attended by nearly 250 scientists. The symposium was followed by a workshop on the role of soy in malnourished populations. The meetings presented an excellent opportunity for Western scientists to learn about current Asian research.

"A recurrent theme of the Symposium was the potential of soyfoods to benefit malnourished populations."

Papers on soy and heart disease were present by Paul Nestel (Australia), Kenneth Setchell (Cincinnati, Ohio, USA), and John Erdman (Univ. of Illinois).

Cancer: The session on soy and breast cancer concluded that "the evidence that adult soy intake reduces breast cancer risk is equivocal, but in contrast, evidence seems to indicate that soy intake during adolescence reduces breast cancer risk later in life. Specifically, all four of the epidemiological studies that have examined this issue have found early soy intake to be protective. In the most recent study,... researchers from the National Cancer Institute found that adult Asian women in the United States who consumed the most soy between ages 5 and 11, were 58% less likely to develop breast cancer than were women who consumed the least amount of soy during this period." Mindy Kurzer (Univ. of Minnesota) presented a study on soy protein and prostate cancer.

Also discusses soy and malnourished populations and other highlights from the Bangkok meeting. Address: M.S.

1695. Vitasoy International Holdings Ltd. 2007. Annual report 2006/07. New Territories, Hong Kong. 148 p. July. 30 cm. [Eng; Chi]
• ***Summary:*** Inside front cover: "For over 65 years, Vitasoy has grown and multiplied its success from a little bean–and is still growing strong." A cartoon shows a team of "Beanies" (soybeans) pulling together on a rope in a tug-of-war.

For the fiscal year ended 31 March 2007, group turnover (sales) was HK$2,693 million, up 6.9% over the previous year. Of these sales, 62% came from Hong Kong, 16% from North America, 10% from Australia and New Zealand, 9% from Mainland China, and 3% from the rest of the world.

Gross profit was HK$1,563 million, up 5.5% from the previous year. Basic earnings per share were 17.3 HK cents, up 0.6%. Dividends per share were 15.5 HK cents, the same as the previous year.

At "Chairman's statement," a photo shows Winston Yau-lai LO, age 66. His resume is found on p. 40. He has two sisters, both married, Myrna and Yvonne. Total dividends for the year are 19.5 cents.

During the year the plant in Massachusetts [Nasoya] generated HK$379 million in revenue a decline of 1.8% from last year. "Operating loss increased to HK$49 million due mainly to the costs associated with the new product launches, declining tofu sales, and additional trade expenses to drive aseptic soymilk sales" (p. 24).

A five-year summary (2003 to 2007; p. 147) shows that, during this entire period, sales increased 20.9% and annual profit increased by 45.7%. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1696. F.G. Roberts: About us (Web article printout). 2007. http://www.soyproducts.com.au/aboutus.htm. Printed Aug. 10. 1 p.
• ***Summary:*** Contents: Milling facility. Blending facility. Corporate philosophy. Legal entity.

"Soy Products (Sales) Pty. Ltd. is a family owned and operated company. The company was purchased in 1954 from Mr. F.G. Roberts (1892-1977) a renowned Naturopath, Dietitian and Chiropractor who started the business in 1932 in Chapel Street, East St. Kilda. In 1936 Roberts began manufacturing the first soy based foods for human consumption in Australia using imported American soy ingredients. The company has not used imported soybeans since the early 1960s." Address: Australia.

1697. History of the Chiropractic & Osteopathic College of Australasia (Web article printout). 2007. http://www.coca.com.au/history.htm. Printed Aug. 19. 2 p.
• ***Summary:*** "Frederick George Roberts founded the Chiropractic and Osteopathic College of Australasia in 1959. Prior to this time F.G. Roberts was a Natural Health Practitioner embracing Chiropractic, Osteopathy and Naturopathy and had clinics in Ballarat, Geelong, Sydney, Newcastle, Brisbane, Ipswich, Toowoomba, Maryborough, Bundaberg, Mackay, Adelaide, Perth and Fremantle. He visited all these clinics regularly and gave public lectures on natural healing. From 1959 onwards his interest turned more to Chiropractic.

"The Melbourne based College was originally located in South Yarra, moved to South Melbourne in 1965 and to East Malvern in 1974. In the mid 60's the term Osteopathic was dropped from the title of the College,... In 1964 F.G. Roberts lead a deputation of chiropractors to the then Minister for Health, Sir Ronald Mack MLC, seeking registration for chiropractors. The Minister advised the deputation that a training institution of acceptable standards would have to be established before registration could be considered." Address: Australia.

1698. Erickson, Leeann. 2007. Re: F.G. Roberts information. Letter (e-mail) to William Shurtleff at Soyinfo Center, Oct. 7. 2 p.

• ***Summary:*** "Please accept my apologies for the time it has taken for me to contact you! I really struggled to find much genealogical information about my Great Grandfather. I have researched a couple of libraries here in Melbourne, but the genealogical websites did not fare too well, considering the cost for research which I cannot afford at this point. I have managed to find an obituary, though! It is attached to the end of this email.

"I found a few dates that you may find helpful. They are as follows: F G Roberts was born 28 November, 1892 in Hobart, Tasmania and died 17 October 1977 in Nunawading, Victoria. Son of William Thomas Roberts and Ellen Bloomfield.

"He married Gladys Maude Griffiths (born 13 July, 1895 and died 12 July 1978) on 14 February 1914 at the Hobart Registrary Office, Tasmania. However, I am not sure if this is actually when the marriage took place, or if this was the date their marriage was actually registered. It was explained to me that back at the turn of the century, a lot of marriages happened without actually being registered until someone was available to register marriages in the region. But, considering they were in Hobart, I don't think this was the case with my great grandparents. And considering the actual date (Valentine's Day), it would seem that this was the date they were actually married.

"They had three children: Fred, born in Hobart 14 September 1911, Horace Eric, born in North Lyell 30 September 1914 and Gladys Ellen, born in North Hobart 25 February 1916. Fred died in Brisbane, Queensland in 1967, and Horace died in WW2 in a prison camp (Changi I believe) in Singapore in 1943. Gladys is still living in Melbourne, now 91 years of age.

"I have not been able to gather information about their families, because the family is quite scattered. And the family of my Grandmother, Gladys, has been estranged for many years. I'm not sure how much family information I should be sharing because of this, but I can tell you that my Father, Ian Robert, was Gladys' second son, born on 29 July 1941. He married Margaret Leslie Thorpe (born 19 October 1942) on 8 September 1963, in Nunawading, Melbourne Victoria. They had two children, my brother, Brendan Leslie, born 21 July 1964, and myself, born 3 September 1965. My father died suddenly of a brain tumour on 17 April 1995.

"It's interesting that you wondered how well known F G Roberts was in the Seventh-day Adventist Church. From conversations I have had, the church actually shunned him for his beliefs in his work, especially iridology. Apparently, the practise of Chiropractics, Iridology, etc was not widely accepted in Australia when my Great Grandfather set up his medical Practices, and even less accepted among Adventists. My Great Grandfather had brought my Great Grandmother into the Adventist Church, but for many years, he was not a member because of the way he had been treated by the Church. (And rightly so, in my opinion!!) However, he did return to the church after many years, and as you said, died a Seventh-day Adventist. He and my Great Grandmother are buried together at Springvale Cemetery, Melbourne, Victoria.

"In answer to your question regarding his connection to the other Roberts' mentioned, this was very hard for me to find out! There are a lot of Roberts' in Tasmania, and I'm sure they are all connected in some way, but I would probably have to find an expert who would be willing to research back that far.

"I'm sorry I couldn't be more helpful at this point, but if there is any other specific information you are wanting, please let me know and I will see what I can do. I am glad that you are writing about my Great Grandfather. He and my Great Grandmother were very good and generous people, and I have many childhood memories of them." Address: Melbourne, Australia.

1699. Lawn, R.J. 2007. Keynote address: A brief history of the establishment of the Australian soybean industry. In: D. Grey, ed. 2005. Proceedings of the 13th Australian Soybean Conference. Barooga, New South Wales, Australia: Riverina Soybean Growers Association. 12 p. Held 1-3 March 2005 at Barooga, New South Wales. [40 ref]

• ***Summary:*** Contents: Abstract. Introduction. The early years before industry establishment. Understanding varietal adaptation to develop successful agronomic management: Environmental control of phenology in the field, relation between phenology and biomass, relation between phenology and harvest index (HI), relations between biomass, seed yield, and HI, implications for agronomic management, implications for soybean breeding objectives. Epilogue.

"Abstract: Commercial soybean production in Australia began in the subtropics of southeastern Queensland, followed quickly by northwestern New South Wales. The first extensive introductions of cultivated varieties were made in the 1930s as part of a search for high protein grains to solve the dry season 'protein gap' in subtropical grazing systems. Further impetus was provided by the perceived need to develop indigenous oil crops in case shipping routes were blockaded during the Second World War. However initial attempts to grow soybeans using varieties and agronomic practices from the southern USA were unsuccessful. It was not until the late 1960s that better adapted varieties were identified and more reliable agronomic practices were developed, based on an understanding of how photo-thermal conditions affected phenology and yield potential and the implications for seasonal and regional adaptation."

"The early years before industry establishment: Serious interest in soybeans in Australia can be traced back to when commercial production began to expand in the USA [1930s], some four decades before the local industry was established (Table 1). During those four decades, over 1,000 soybean varieties were introduced and evaluated by various state and federal agencies, in a largely *ad hoc* way and unsuccessfully in terms of identifying varieties that could be reliably grown commercially (Byth 1971).

"The most extensive program was run by the CSIR, as part of its search for high protein feedstuffs that would help overcome the protein gap that constrained northern grazing livestock productivity (Paltridge 1942, Miles 1949)."

Establishment of the soybean industry in Australia drew heavily on U.S. varieties and experience. "Byth and Laing did their PhD studies, and O.G. Carter undertook research at Iowa State University. Lawn and J.R. Rose undertook PhD studies at the University of Minnesota."

Figure 1 contains 3 graphs which show the area (1000 ha), production (1000 tonnes) and yield (tonnes/ha) of soybeans in Australia from 1968 (when production = 0 and yield = 0.9 tonnes/ha, for feed) until 1992. Top yields rose to almost 2.0 tonnes/ha. "The area sown to soybeans expanded rapidly following the release in 1970 of grower advisory bulletins on how to grow the crop in Queensland. Added impetus was provided by the expansion of commercial production in northern New South Wales a couple of seasons later (from Lawn & Imrie 1993)."

Table 1, titled "Key research and industry people involved in the establishment of the Australian soybean industry in SE Queensland and northern New South Wales." There are columns for (1) Names of the key people–divided into Queensland, followed by northern NSW. (2) Organization or occupation, and location. (3) Role and key publications. For example: Under Queensland: "T.B. Paltridge, CSIR Canberra / Gatton, Introduction and evaluation 1930-1946 (Paltridge 1942)." Also: "C. Flegler, Farmer, Darling Downs, Championed soybeans through QGGA." Address: CSIRO Div. of Tropical Crops and Pastures, The Cunningham Lab., St. Lucia, Queensland, Australia.

1700. Roseboro, Ken. 2008. The 2008 non-GMO sourcebook: A buyers guide to global suppliers of non-GMO and organic seeds, grains, ingredients, and foods. Fairfield, Iowa: Writing Solutions, Inc. 102 p. Illust. (both color, and blue and white photos). Index. 28 cm.
• ***Summary:*** Contents: Editor's introduction (by Ken Roseboro, publisher and editor). Suppliers of non-GMO products: United States, Canada, Europe, Africa / Middle East, Asia / Australia, Latin / South America. The Non-GMO Project special section (The Non-GMO Project rises to forefront of natural food industry, Verification aims to protect natural and organic foods from GMOs, assure consumers, The Non-GMO Project facts, Michael Funk [President and CEO of United Natural Foods, Inc., UNFI]: "Time has come" for The Non-GMO Project, Company profile: Straus Family Creamery becomes first company to be verified through Non-GMO Project). Related products, services, and organizations. Indexes: Index of non-GMO suppliers by product category: Seeds, grains and oilseeds (incl. soybeans {identity preserved, specialty, food- and feed-grade}, soybeans–organic), canola / rapeseed products, corn products, soy products (phytosterols, soy flakes, soy flour, soy germ concentrate, soy grits, soy lecithin {including organic}, soy meal {including organic}, soy nuts, soy oil {including organic}, soy oil–low linolenic, soy protein, isolates and concentrates, soy protein–textured, soymilk, soymilk powder, soy sauce, vitamin E / tocopherols), other ingredients and processing aids (citric acid, dairy ingredients, enzymes, flavors, food colors, organic sweeteners, etc.), food products, animal feed. Index of related products, services and organizations. Index of related products, services, and organizations. Comprehensive index. Order form for *The Organic & Non-GMO Report.*

This comprehensive book gives the single best picture of the growing industry, worldwide, opposed to genetic engineering of foods and feeds. Address: Editor / Publisher. Phone: 1-800-854-0586.

1701. Shurtleff, William; Aoyagi, Akiko. comps. 2008. History of soybeans and soyfoods in Australia, New Zealand and Oceania (1770-2008): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 476 p. Subject/geographical index. Printed 18 July 2008. 28 cm. [1424 ref]
• ***Summary:*** The title page states: Australia, Fiji, French Polynesia (incl. Tahiti), Guam, Kiribati, Marshall Islands, Micronesia, Nauru, New Zealand, Palau Isl., New Caledonia, Samoa (American), Samoa, Wallis and Futuna, Papua New Guinea, Solomon Islands, Tonga, Tuvalu, Vanuatu. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

1702. Shurtleff, William; Aoyagi, Akiko. comps. 2008. Friedrich Haberlandt–History of his work with soybeans and soyfoods (1876-2008): Extensively annotated bibliography and sourcebook. Lafayette, California: Soyinfo Center. 129 p. Subject/geographical index. Printed 25 July 2008. 28 cm. [169 ref]
• ***Summary:*** Professor Friedrich Haberlandt of the University of Vienna awakened Europe to the potential of

the soybean and soyfoods and initiated the first extensive soybean cultivation trials. The results of his work appeared in his magnum opus *Die Sojabohne* ("The Soybean"), published in 1878. His work played a major role in the culture of soybeans in Europe and in stimulating further research on soyfoods nutrition and utilization. Haberlandt's writings contain a surprisingly large amount of material about soyfoods, hitherto never translated into English. Haberlandt predicted that soybeans and soyfoods would play an important role in Western diets, eventually coming to be widely used as a supplement to the carbohydrates of the potato, at least in the diets of the poor, providing an abundance of essential and low-cost protein, fat, and energy. Address: Soyinfo Center, P.O. Box 234, Lafayette, California 94549. Phone: 925-283-2991.

1703. Vitasoy International Holdings Ltd. 2008. Annual report 2007/08. New Territories, Hong Kong. 164 p. July. 30 cm. [Eng; Chi]

• ***Summary:*** This is a year of discontinuity of sales and gross profit figures, for complex reasons explained on page 7. We will use the new, adjusted numbers below. For the fiscal year ended 31 March 2008, adjusted group turnover (sales) was HK$2,416 million, up 15% over the previous year. Of these sales, 52% came from Hong Kong, 17% from North America, 15% from Mainland China, 12% from Australia and New Zealand, and 4% from the rest of the world.

Gross profit was HK$1,131 million, up 16% from the previous year. Basic earnings per share were 20.9 HK cents, up 21%. Dividends per share were 21.5 HK cents, up 10%.

At "Chairman's statement," a photo shows Winston Yau-lai LO, age 67. His resume is on p. 46. Total dividends for the year are 21.5 cents per share.

In North America, Vitasoy USA grew by 8%, reversing the negative growth trend since 2002/03. Although Vitasoy USA still lost money, this loss was 53% less than in the previous year.

A five-year summary (2004 to 2008; p. 163) shows that, during this entire period, sales increased 26.5% and annual profit more than doubled, increasing by 115%. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1704. Smith, Paul. 2008. Re: Update on soy in Australia. Letter (e-mail) to William Shurtleff at Soyfoods Center. Aug. 14. 2 p.

• ***Summary:*** There has been "a prolonged drought is Australia. In a good season Australia can grow 100,000-120,000 tonnes of soy beans but in May 2006 the total harvest was 35,000 tonnes and in May 2007 it was 30,000 tonnes. The relative situations for the rice (a total harvest of 15,000 tonnes compared to up to 1,300,000 tonnes in a good season), chickpeas and wheat crops were far worse with our situation being exacerbated by the global scene. We have had a mining boom in West Australia and Queensland which has placed enormous pressures on labour quality and costs. Demand for iron ore and steel by China has seen the costs of mild steel and stainless steel rise enormously, by more than 100% so far in this calendar year and over the past 2 or 3 years stainless steel has trebled in price.

"We have been working on a plant upgrade and expansion for several years to get into export markets to China, Taiwan, Korea and Japan. I almost wish I had never started on this project given what has transpired. The scope of the project expanded as we progressed and we have introduced an enormous amount of new and sophisticated technology. We have experienced enormous blowouts in budgets and timeframes only to find as we near completion of the project that we have an extremely high Australian Dollar, very high costs due to the factors outlined and insufficient crops to service local demand let alone growing export markets. Our sales have dropped by 30% and we have halved our workforce and we are battening down the hatches. Over the next few months we are completing the installation of a new mezzanine floor level and new vertical, form, fill and seal machine to bag both bulk and retail products directly from the mill. Half an installation is a waste of time and money as no benefit can be derived. Somehow I am still sane and smiling. We are working on our new websites and they will be up and running in the next few weeks. We are reinventing ourselves business-wise as there has been massive investment in our industry and there is now very significant surplus productive capacity and insufficient raw material to keep it all running at anywhere near full capacity. Some players will inevitably collapse. We have to capitalise on being a smaller, more flexible, specialist niche player."

1705. *Organic and Non-GMO Report (The) (Fairfield, Iowa).* 2008. Monsanto sale of rBGH called a major milestone. 8(8):4-5. Sept.

• ***Summary:*** Monsanto announced that it has agreed to sell Posilac, its bovine growth hormone, to Eli Lilly and Co. for $300 million. The drug has failed to be approved in Canada, the European Union, Japan, Australia, and New Zealand. Milk "from cows injected with rBGH contains high levels of insulin growth factor-1 (IGF-1), a hormone that is linked to prostate and colon cancer."

1706. Vitasoy International Holdings Ltd. 2008. Interim report 2008. New Territories, Hong Kong. 48 p. Nov. 30 cm. [Eng; Chi]

• ***Summary:*** For the six months ended 30 Sept. 2008, group turnover (sales) was HK$1,425 million, up 20% over the same period last year. Gross profit was HK$637 million, up 12% over the same period last year. "In view of the Group's strong financial position and satisfactory operating performance, the Board of Directors has declared an interim dividend of HK$2.8 cents per ordinary share." Sales performance was very encouraging in Mainland China (60%) and in Australia and New Zealand (23%); it was healthy in Hong Kong (5%) and in North America (5%).

North America production efficiency: During the 1st half of fiscal 2008/09 the Group's production plant in Ayers, Massachusetts [Nasoya] had sales of HK$175 million, an increase of 11% over the same period last year. "Operating loss narrowed to HK$9 million, versus HK$10 million for the corresponding period in fiscal 2007/08" (p. 12).

North America market performance: In 2007, retail sales of soyfoods grew by only 1%. Tofu sales decreased by 2% whereas soymilk sales grew by 3%, of which refrigerated soymilk was up 6% and ambient [Aseptic] soymilk was down 8%. "Total tofu sales grew by a healthy 12% while pasta sales were up by an even more impressive 34%. However soymilk and imported products were down by 16% and 33% respectively" (p. 12-13).

In April 2008 the Vitasoy Group acquired the entire equity of Unicurd Food Co., (Private) Ltd. ("Unicurd"), which is a leading manufacturer and marketer of soyfoods in Singapore. "This acquisition is aimed at expanding the Group's market presence in the Asia Pacific Region." The Unicurd production plant "at Senoko South Road, Singapore, supports the Singaporean market and exports to Europe, New Zealand, South Africa, Dubai and other parts of Asia. In the six months to 30 Sept. 2008 Unicurd recorded total sales revenue of HK$31 million..." (p. 13).

In Hong Kong, Vitasoy has a new logo and package design (p. 15). Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: 466 0333.

1707. Clearspring, Ltd. 2009. Clearspring (Website printout–part). http://www.clearspring.co.uk. Printed Jan. 28.

• ***Summary:*** Contents: Home page. About us. Awards. Glossary. FAQ. News. Books. Links. Stocklists. Trade. Contact. Food quality. Producers. Health. Recipes. Where to buy.

"Introducing the chairman: Christopher Dawson was born 19 September 1953, at New Plymouth Hospital, New Zealand and grew up in Opunake, a rural town in New Zealand. He is the third son of William Geoffrey and Joan Dawson.

"Education: He did his primary, secondary and tertiary education in New Zealand. He first started independently studying vegetarianism and organic agriculture at the age of 18. In 1974 he came to London to further his studies of organic agriculture, both at the Henry Doubleday Horticulture and Nutrition Research Centre in Braintree and the Bio Dynamic Agriculture section at the Rudolf Steiner Emerson College, Sussex.

"Beginning Organic Food Distribution: In 1977, he opened and managed the East West Natural Foods Store at the Community Health Foundation, Old Street, London. He developed this shop into a distribution centre for traditional natural / macrobiotic foods, sourced from both local organic farms and from abroad, especially from Japan.

"From August 1978 through to January 1980 he traveled extensively throughout Europe, America, Australia and Asia, investigating the traditional dietary practices and food-processing techniques. He studied at the East West Foundation in Boston, Mass, U.S.A. about Far Eastern philosophical principles and traditions and studied the distribution network of the natural foods movement in both America & Europe, as well as Australia and New Zealand.

"Eighteen Years in Japan: Christopher made his first trip to Japan in July 1979, visiting natural food enterprises throughout Japan with Mr. A. Kazama, president of Mitoku Co. Ltd. He returned to Japan in January 1980 and began extensive studies into the daily life and cultural and dietary practices of the Japanese people.

"At the end of 1980 he commenced full-time employment at Mitoku Co. Ltd., the major exporter of traditional, natural Japanese foods. During the eighteen years he spent with the company Christopher studied Japanese Foods & production, worked with the producers to develop products to suit the needs of customers abroad and help the producers become compliant with EU organic certification. He also travelled extensively to introduce the foods to markets worldwide, with the intention to see if Japanese foods could really become international foods.

"Building Clearspring in the UK, Europe and the Middle East: In September 1993, Christopher bought the Clearspring Ltd. company, which was then a London based wholesaler with one shop, the very shop that Christopher started in 1977! By 1998, he felt he had sufficient knowledge of traditional, top quality Japanese food and decided it was the right time to come back to UK and to focus on marketing organic and authentic Japanese foods under the Clearspring brand.

"Recognition from the Japanese government: On 25 May 2007, Christopher received the Award for Overseas Promotion of Japanese Food 2007 from the Ministry of Agriculture, Forestry and Fisheries of Japan, for his distinguished contribution to the promotion of Japanese organic food worldwide."

Down the right side of this page are the following photos: (1) Christopher seated at a desk, writing in a notebook, looking very happy, at an early age (about 6), already a promoter of the written word. (2) Christopher at the East West Natural Foods Store in 1977. (3) Christopher with his mother at home in New Zealand. (4) Christopher at Mitoku in Japan (with Mr. Kazama and staff) in the late 1980s. (5) Photo taken 11 Oct. 1990 with Lima Ohsawa, then 91, the wife of macrobiotic teacher George Ohsawa and Aveline Kushi, then 67, the wife of macrobiotic teacher Michio Kushi. (6) Christopher with his young family (Japanese wife and 3 children) in Japan in the early 1990s. (7) Christopher, with his wife and two sons in Spain in 2006. (8) Christopher now regularly visits Clearspring's suppliers in Japan, here with team of Sendai Miso Shoyu Company and Mr. Yoshida from Mitoku. (9) Christopher in Japan with Onozaki san, miso producer. (10) Christopher at the Organic & Natural Products Show, London 2007. (11) Special vegetarian foods prepared at the Dawson household, to celebrate the New Year. Address: 19A Acton Park Estate, London W3 7QE, UK. Phone: +44 (0)20 8749 1781.

1708. Roseboro, Ken. 2009. The 2009 non-GMO sourcebook: A buyers guide to global suppliers of non-GMO and organic seeds, grains, ingredients, and foods. Eugene, Oregon: Evergreen Publishing, Inc. 106 p. Illust. (both color, and blue and white photos). Index. 28 cm.
• ***Summary:*** Contents: Editor's introduction (by Ken Roseboro, publisher and editor). Suppliers of non-GMO products: United States, Canada, Europe, Africa / Middle East, Asia / Australia, Latin / South America. The Non-GMO Project special section (Non-GMO verification of organic foods begins, Non-GMO Project facts, Non-GMO corn chips create a niche for healthy snack foods, Grain suppliers express concern about the Non-GMO Project, First inspector training for non-GMO verification held). Related products, services, and organizations. Indexes: Index of non-GMO suppliers by product category: Seeds, grains and oilseeds, specialty grains and crops, canola / rapeseed products and ingredients, corn / maize products and ingredients, soy products and ingredients (phytosterols, soy flakes, soy flour, soy germ concentrate, soy grits, soy lecithin {including organic}, soy meal {including organic}, soy nuts, soy oil {including organic}, soy oil–low linolenic, soy protein, isolates and concentrates, soy protein–textured, soymilk, soymilk powder, soy sauce, vitamin E / tocopherols), other ingredients and processing aids (citric acid, dairy ingredients...), sweeteners, food products, animal feed. Index of related products, services and organizations. Complete index of listings. Order form for *The Organic & Non-GMO Report.*

This comprehensive book gives the single best picture of the growing industry, worldwide, opposed to genetic engineering of foods and feeds. Address: Editor / Publisher, P.O. Box 51137, Eugene, Oregon 97405. Phone: 1-541-343-2272.

1709. *SoyaScan Notes.* 2009. Soybean germplasm collections on the IPGRI website (Overview). May 6. Compiled by William Shurtleff of Soyinfo Center.
• ***Summary:*** These four spreadsheet databases were sent to Soyinfo Center by Dr. Randall Nelson, curator, USDA Soybean Germplasm Collection, Urbana, Illinois. He created the databases (which reside only on his computer) using information found at the FAO website for germplasm collections: http://www.bioversityinternational.org / Information_Sources /Germplasm_Data bases / Germplasm_Collection_Directory /index.asp. At the "Biodiversity Directory of Germplasm Collections Query Form," after "Taxon" enter "Glycine max" then click "Search" at bottom of page. Wait for several minutes for results to be displayed.

(1) The 40 largest global *Glycine max* [domesticated soybean] germplasm collections–in descending order of no. of accessions in collection. (1) Institute of Crop Germplasm Resources (CAAS), China, 23,578 accessions. (2) Soybean Germplasm Collection, USDA, USA, 18,046. (3) Asian Vegetable Research and Development Centre (AVRDC), Taiwan, 12,508. (4) Nanjing Agricultural University, China, 10,000. (5) Institute of Agroecology and Biotechnology, Ukraine, 7,000. (6) N.I. Vavilov Research Institute of Plant Industry, Russia, 6,126. (7) Centro Nacional de Pesquisa de Recursos Geneticos e Biotec. (CENARGEN), Brazil, 4,693. (8) Soybean Research Institute Jilin Academy of Agric. Sciences, China, 4,200. (9) All India Coordinated Research Project on Soybean, Govind Bal. Pant Univ., India, 4,015. (10) Centro Nacional de Pesquisa de Soja (CNPSO), EMBRAPA, Brazil, 4,000. (11) Department of Genetic Resources I Nation. Inst. of Agrobiol. Resour. Japan, 3,741. (12) Crop Experiment Station Upland Crops Research Division, Korea, Republic of, 3,678. (13) Australian Tropical Crops Genetic Research Centre, Australia, 3,144. (14) Genebank, Inst. for Plant Genetics and Crop Plant Research (IPK), Germany, 3,063. (15) Regional Station, National Bureau of Plant Genetic Resources (NBPGR), India, 2,808. (16) Taiwan Agricultural Research Institute (TARI), Taiwan, 2,699. (17) National Research Centre for Soybean, India, 2,500. (18) Crop Breeding Institute DR & SS, Zimbabwe, 2,236. (19) Sukamandi Research Institute for Food Crops (SURIF), Indonesia 2,194. (20) Nanjing Agricultural University, China, 2,168. (21) Instituto Agronomico de Campinas (I.A.C.), Brazil, 2,000. (22) National Plant Genetic Resources Laboratory, IPB/UPLB, Philippines, 1,764. (23) CSIRO Division of Tropical Crops and Pastures, Australia, 1,600. (24) Genetic Resources Dep.–Research Inst. for Cereals and Ind. Crops, Romania, 1,600. (25) G.I.E. Amelioration Fourragere, France, 1,582. (26) Soyabean Research Institute, Heilongjian Academy of Agric. Sc., China, 1,558. (27) Institute of Oil Crops Research CAAS, China, 1,529. (28) Institute of Plant Breeding, College of Agriculture UPLB, Philippines, 1,508. (29) Instituto Nacional de Investig. Agricolas, Station de Iguala, Mexico, 1,500. (30) Stat. de Genetique et Amelioration des Plantes, INRA C.R. Montpellier, France, 1,404. (31) Kariwano Laboratory, Tohoku Nat. Agricultural Experiment Station, Japan, 1,400. (32) Int. Institute of Tropical Agric. (IITA), Nigeria, 1,358. (33) Centro de

Investigacion La Selva, (CORPOICA), Colombia, 1,219. (34) Institute of Crop Breeding and Cultivation, CAAS, China, (1,200). (35) Institute for Field and Vegetable Crops, Yugoslavia, 1,200. (36) Institute of Industrial Crops Jiangsu Academy of Agric. Sciences, China, 1,199. (37) Corporacion Colombiana de Investigacion Agropecuaria, CORPOICA, Colombia, 1,170. (38) Genebank Cereal & Oil Crops Inst. Hebei Academy of Agric. Sciences, China, 1,154. (39) Instituto Nacional de Investigaciones Forestales, Agricolas y Pecuarias (INIFAP), Mexico, 1,124. (40) Maharashtra Association for the Cultivation of Science, India, 1,081.

(2) Germplasm collections (105) that have *G. max*, *G. soja*, advanced cultivars, breeding and inbred lines, cultivars, genetic stocks, introgressed forms, landrace or traditional cultivar, mutants, wild/weedy species, or unknown. Listed alphabetically by country: Albania 1 collection. Argentina 3. Australia 3. Bolivia 1. Brazil 5. Bulgaria 1. Canada 1. Chile 1. China 15. Colombia 2. Cuba 1. Czech Republic 1. Ecuador 1. France 6. Germany 1. Hungary 2. India 8. Indonesia 3. Japan 5. Korea, Rep 1. Madagascar 1. Mexico 2. Nepal 2. Nigeria 1. Papua New 1. Paraguay 1. Peru 1. Philippines 2. Poland 1. Romania 2. Rwanda 1. Slovakia 1. South Africa 1. Spain 1. Sri Lanka 1. Sweden 1. Switzerland 1. Taiwan 3. Thailand 4. Ukraine 4. Uruguay 1. Venezuela 1. Vietnam 4. Yugoslavia 1. Zambia 1. Zimbabwe 1.

(3) The 23 largest global *Glycine soja* [wild annual soybean] germplasm collections–in descending order of no. of accessions in collection. (1) Institute of Crop Germplasm Resources (CAAS), China, 6,172 accessions. (2) Soybean Germplasm Collection, USDA, USA, 1,114. (3) Soybean Research Institute Jilin Academy of Agric. Sciences, China, 600. (4) Soyabean Research Institute, Heilongjiang Academy of Agric. Sc., China, 400. (5) Crop Experiment Station Upland Crops Research Division, Korea, Republic of, 342. (6) Asian Vegetable Research and Development Centre (AVRDC), 339. (7) N.I. Vavilov Research Institute of Plant Industry, Russia, 310. (8) Breeding Laboratory, Faculty of Agriculture, Iwate University, Japan, 151. (9) CSIRO Division of Tropical Crops and Pastures, Australia, 60. (10) Taiwan Agricultural Research Institute (TARI) Taiwan, 46. (11) Hunan Academy of Agriculture Sciences, China, 45. (12) Tieling District Agricultural Research Institute, China, 29. (13) Department of Agronomy National Chung Hsing University, Taiwan, 20. (14) Eastern Cereal & Oilseed Research Centre, Saskatoon Research Centre, Saskatchewan, Canada, 18. (15) Soyabean Breeding Laboratory, Tokachi Agric. Exp. Station, Nemuro, Hokkaido, Japan, 15. (16) Instituto Nacional de Investigaciones Forestales, Agricolas y Pecuarias (INIFAP), Mexico, 9. (17) All India Coordinated Res. Project on Soybean, Govind Bal. Plant Univ., India, 7. (18) Maharashtra Association for the Cultivation of Science, India, 6. (19) Sukamandi Research Institute for Food Crops (SURIF), Indonesia, 4. (20) Research Institute for Food Crops Biotechnology–RIFCB, Indonesia, 4. (21) Kariwano Laboratory, Tohoku Nat. Agricultural Experiment Station, Japan, 3. (22) Genebank, Inst. for Plant Genetics and Crop Plant Research (IPK), Germany, 2. (23) S.K. University of Agriculture and Technology, India, 1.

(4) Germplasm collections that have at least one wild perennial relative of the soybean *(Glycine* species, such as *Glycine clandestina)*, in descending order of total number of accessions: (1) CSIRO Division of Plant Industry, Australia, 2,102. (2) USDA Soybean Germplasm Collection, USA, 919. (3) Plant Genetic Resources Unit, Agricultural Research Council, South Africa, 281. (4) CSIRO Division of Tropical Crops and Pastures, Australia, 87. (5) Asian Vegetable Research and Development Centre (AVDRC), Taiwan, 69. (6) N.I. Vavilov Research Institute of Plant Industry, Russia, 31. (7) Breeding Laboratory, Faculty of Agriculture, Iwate University, Japan, 23. (8) National Dept. of Agriculture, Dir. of Plant and Quality Control, South Africa, 23. (9) Seed Bank, Seed Conservation Sect. Royal Botanic Gardens, Kew, UK, 1.

1710. Vitasoy International Holdings Ltd. 2009. Annual report 2008/09: Where healthy life begins. New Territories, Hong Kong. 184 p. July. 30 cm. [Eng; Chi]

• ***Summary:*** For the fiscal year ended 31 March 2009, adjusted group turnover (sales) was HK$2,783 million, up 14.3% over the previous year. Of these sales, 53% came from Hong Kong and Macau, 20% from Mainland China, 15% from North America, 10% from Australia and New Zealand, and 2% from Singapore.

Gross profit was HK$1,279 million, up 13.1% from the previous year. Sales analysis by product categories: Soymilk 44%, tea 20%, tofu 10%, lunch boxes and snacks 8%, dairy milk 5%, etc.

At "Chairman's statement," a large color photo shows Winston Yau-lai LO, age 68. His resume is on p. 49. The resume of Ms. Yvonne Mo-ling LO, aged 61 (who is on the board of directors), is on page 51. Total dividends for the year are 21.5 cents per share.

In North America, Vitasoy USA lost money but, "in terms of profit from operation, it continued to achieve improvement by narrowing its operating loss further to HK$6 million, versus HK$11 million for the fiscal year 2007/2008. Tofu sales in North America grew by 11% "and pasta / wrap sales by an even stronger 29%. However, the sales of soymilk and imported products were down by 18% and 20% respectively." "In the last quarter of 2008, it was decided that Vitasoy USA should exit the loss-making aseptic soymilk business and concentrate on the tofu and Asian market businesses which were making positive contributions to the Group" (p. 33-34).

Singapore: "In early April 2008 we acquired the entire equity of Unicurd–a leading soyfood manufacturer and marketer in Singapore." Details on Unicurd's sales are given as are color photos of 8 of its products.

A five-year summary (2005 to 2009; p. 4) shows that, during this entire period, sales (turnover) increased 50.5% and annual profit increased 52.8%. Address: No. 1, Kin Wong Street, Tuen Mun, New Territories, Hong Kong. Phone: (852) 2466 0333.

1711. Shurtleff, William. 2010. Do the English words "ketchup," "catchup," and "catsup" trace their origin back to Chinese (Cantonese) or to Malay? (Editorial). *SoyaScan Notes.* Jan. 15.

• ***Summary:*** If the English words for "ketchup" trace their origin back to Chinese, then they probably trace their origin back to the Cantonese, because Cantonese speakers (from Canton / Guangzhou in southern China) made up the great majority of emigrants from China starting during and after the Mongol Dynasty (also called Yuan Dynasty; 1279-1368) when the Mongols ruled China.

In Cantonese, there is a word that sounds very similar to the English word "ketchup." Written with two characters, it is pronounced "ke-tsup." The first character means "tomato," and the second character means "sauce," "juice," or "liquid."

Thus, the Cantonese word seems in both sound and meaning to be very similar to the English word "ketchup."

Written Cantonese is used primarily in Hong Kong and in overseas Chinese communities. It uses characters not found in the Standard Mandarin, and is not easily intelligible to Mandarin speakers

Romanization: Cantonese romanization systems are based on the accent of Canton and Hong Kong, and have helped define the concept of Standard Cantonese. The major systems are Barnett-Chao, Meyer-Wempe, the Chinese government's Guangdong Romanization, Yale and Jyutping. While they do not differ greatly, Yale is the one most commonly seen in the West today. The Hong Kong linguist Sidney Lau modified the Yale system for his popular Cantonese-as-a-second-language course, so that is another system used today by contemporary Cantonese learners. And there is the International Phonetic Alphabet (IPA).

In Malay–the language of today's Indonesia (which includes Java)–the word for soy sauce was written *ketjap* and is today written *kecap.* The sound is very similar to the Cantonese sound but the meaning is very different.

By the way, none of the three English words for "ketchup" (nor any words with similar sounds) is found in the book *Hobson-Jobson: a glossary of colloquial Anglo-Indian words and phrases,...,* by Sir Henry Yule, and Arthur Coke Burnell.

As the Contonese left China, they almost surely took soybeans and soy sauce technology with them.

Since Java and Indonesia are closer to Canton than are Australia or New Zealand, it seems likely that more Cantonese settled there. More important, Java and Indonesia have much longer cultural and economic ties to Asia than do Australia or New Zealand, so it is more likely that Cantonese foodways would take root in Java.

A product named "Ketchup" (spelled in various ways) had arrived in Europe by the late 1600s and early 1700s. It was probably imported from Southeast Asia. Yet when ketchup arrived in Australia and New Zealand, a century later, it was imported not from nearby Southeast Asia, but from far-away Europe. Address: Founder and owner, Soyfoods Center, Lafayette, California. Phone: 925-283-2991.

1712. Roseboro, Ken. 2010. The 2010 non-GMO sourcebook: A buyers guide to global suppliers of non-GMO and organic seeds, grains, ingredients, and foods. Fairfield, Iowa: Evergreen Publishing, Inc. 106 p. Illust. (both color, and blue and white photos). Index. 28 cm.

• ***Summary:*** Contents: Editor's introduction (by Ken Roseboro, publisher and editor). Suppliers of non-GMO products: United States, Canada, Europe, Africa / Middle East, Asia / Australia, Latin / South America. The Non-GMO Project special section (includes comments by Michael Potter and Nature's Path {in Canada}). Related products, services, and organizations. rBGH-free dairy processors in the US. Index of non-GMO suppliers by product category: Seeds (corn, soybeans), canola / rapeseed, processed canola / rapeseed products, corn / maize, processed corn / maize products, soybeans (identity preserved, specialty, organic), processed soy products (flakes, flour, germ concentrate, grits, lecithin, meal, nuts, oil, low linolenic oil, phytosterols, protein, textured protein, soymilk, soymilk powder, soy sauce, tofu, vitamin E / tocopherols), other grains / oilseeds and processed products (alfalfa / hay, barley, cotton,...), other ingredients and processing aids (citric acid, dairy ingredients...), sweeteners, food products, food supplements, animal feed. Index of related products, services and organizations. Complete index of listings. Index of advertisers.

Note 1. In the Suppliers section, many company entries have the Non-GMO Project logo (with an orange and black butterfly on a green leaf) next to their company name (e.g., Eden Foods, p. 17; WholeSoy & Company, p. 42).

This comprehensive book gives the single best picture of the growing industry, worldwide, opposed to genetic engineering. Address: Editor / Publisher, P.O. Box 436, Fairfield, Iowa 52556. Phone: 1-800-854-0586.

1713. *SoyaScan Notes.*2010. Chronology of soymilk worldwide–1950 to present. Part II. Compiled by William Shurtleff of Soyinfo Center.

• ***Summary:*** 1950's–Soymilk enters the modern era as it begins to be marketed in bottles like soft drinks, largely due to work by K.S. Lo of Vitasoy in Hong Kong and Yeo Hiap Seng in Singapore.

1954–Japan's first commercial soymilk, sold in bottles, is introduced by the Ueda Tofu Shop in Hachioji, Tokyo. Dr. Harry Miller was the inspiration for and helped to establish the shop.

1960s–In Japan, soymilk slowly increases in popularity. New manufacturers are: Nihon Tanpaku Kogyo (1962). College Health Foods (later renamed San-iku Foods) in Chiba prefecture with its Soyalac (1969, also inspired and aided by Dr. Harry Miller). Luppy Tanpaku (House Shokuhin) in Saitama prefecture with its Luppy soymilk (1969).

1966–The enzyme lipoxygenase is discovered by scientists at Cornell University [Ithaca, New York] to be responsible for the "beany" flavor in soymilk. A process is developed which could be used to help eliminate this flavor.

1967–Soymilk begins to be packaged aseptically in Tetra Pak cartons. This allows it to be sold without refrigeration for six months or more. The first such product was Beanvit, made by Yeo Hiap Seng Ltd. in Singapore and packaged in a disposable tetrahedron-shaped container.

1970's and 1980's–Soymilk becomes a popular beverage throughout Asia, spreading to Europe, Australia and the United States.

1979–Hong Kong Soya Bean Products Co. Ltd. starts to export Vitasoy, packed in Tetra Brik cartons, to selected countries throughout the world. By the early 1980s exports were going to over 20 countries, both developed and developing. Exports to the USA began in 1980. 1980 Jan.–DE-VAU-GE Gesundkostwerk, a Seventh-day Adventist food company near Hamburg, Germany, launches GranoVita Soja Drink in 500 ml Tetra Brik cartons; this soymilk product is made by N.V. Vandemoortele (one of Europe's largest oilseed crushers, founded in 1934) in Izegem, Belgium.

1980 June–N.V. Alpro is founded by Vandemoortele to take over production of this soymilk. Inspired and headed by Philippe Vandemoortele, Alpro purchased the land on which it was located from Vandemoortele, and became an independent manufacturer. Alpro quickly became Europe's leading producer of soymilk, making private-label brands for scores of companies.

1983 July–Edensoy brand soymilk is launched by Eden Foods of Clinton, Michigan. Imported from Japan (where it is made by Marusan-Ai Co.), it is sold in plain and carob flavors in stand-up foil retort pouches.

1984 Feb.–The first comprehensive study of the soymilk market in the U.S. is published by Soyfoods Center of Lafayette, California. It estimates that total soymilk consumption in the U.S. in 1983 (not including soy-based infant formulas) was 2.68 million gallons (26% of this was imported), and total production of soy-based infant formulas was 32 million gallons.

1984 Aug.–Westsoy Natural brand soymilk is launched by Westbrae Natural Foods of Emeryville, California. Imported from Japan (where it is made by San-Iku Foods), it is sold in one flavor in standup foil retort pouches.

1984 Oct.–Westbrae Natural Malted's, a thick soymilk resembling a milk shake, are launched in many flavors by Westbrae Natural Foods, imported from Japan.

1986 Nov.–Edensoy starts to be made in America by American Soy Products (ASP) at a large, modern plant in Saline, Michigan, and sold in Tetra Brik aseptic cartons. ASP is a joint venture of 4 Japanese companies and Eden Foods.

1988 Nov.–Pacific Foods of Oregon, launches its first soymilk product, Naturally Northwest Soy Beverage [Plain], in a 1-quart Tetra Brik Aseptic carton. The company's new factory is in Tualatin, Oregon.

1990 April–WestSoy Lite, America's first "lite" soymilk, with a low fat content, is introduced in plain, vanilla, and cocoa flavors by Westbrae Natural Foods. Made by adding water to regular soymilk, the product is less expensive to make, but also contains less nutrients, and soon

1990 June–Alpro opens a new soymilk plant at Wevelgem, Belgium. Costing about US$15 million and having a capacity of 45 million liters a year, it is reputed to be the largest in the world. Alpro now makes about 70% of the soymilk in Europe.

1990 Sept. 24–The company name is changed to Vitasoy International Holdings Ltd. from Hong Kong Soya Bean Products Co. Ltd.

1991–There are at least 35 processors or marketers of soymilk in the U.S., increasing production to approximately 9.8 million gallons. Consumption is estimated to be growing at between 15 and 20% per year since 1984.

1993–More than 200 scientific journal articles about soymilk have been published in English, and at least 80 English-language patents on soymilk have been issued between 1912 and 1993.

1994 Jan.–Soy-Um, a low-priced and attractively packaged soymilk, is launched by J&G Inc., a product developer and distributor in Chicago, Illinois. The product is made in Oregon by Pacific Foods.

1995–A market study is published, estimating that $108 million of soymilk was sold in the U.S. in 1994. This equates to approximately 13.5 gallons of soymilk. Sales are projected to have risen to over $130 million, or approximately 16.3 million gallons.

An asterisk (*) at the end of the record means that SOYFOODS CENTER does not own that document.

A plus after eng (eng+) means that SOYFOODS CENTER has done a partial or complete translation into English of that document.

An asterisk in a listing of number of references [23* ref] means that most of these references are not about soybeans or soyfoods.

SUBJECT/GEOGRAPHICAL INDEX BY RECORD NUMBERS

Aburagé. *See* Tofu, Fried

Acid-base balance in diet and health. *See* Nutrition–Acid-Base Balance

Acidophilus soymilk or soy acidophilus milk. *See* Soymilk, Fermented

Adhesives or Glues for Plywood, Other Woods, Wallpaper, Building Materials, Etc.–Industrial Uses of Soy Proteins (Including Soy Flour). 418, 438, 455, 466, 476, 477, 479

Adhesives, Asphalt Preservation Agents, Caulking Compounds, Artificial Leather, Polyols, and Other Minor or General–Industrial Uses of Soy Oil as a Drying Oil. 296, 549, 592

Adventists, Seventh-day. *See* Seventh-day Adventists

ADM. *See* Archer Daniels Midland Co.

Adzuki bean. *See* Azuki Bean

Africa (General). 60, 64, 94, 103, 105, 119, 122, 132, 152, 235, 311, 313, 325, 374, 386, 402, 403, 406, 430, 431, 506, 529, 549, 589, 652, 698, 718, 734, 763, 786, 796, 805, 848, 857, 894, 917, 989, 1014, 1020, 1023, 1041, 1047, 1055, 1080, 1190, 1350, 1444, 1594, 1625, 1641

Africa–Algeria, Democratic and Popular Republic of. 313, 379, 385, 427, 428, 430, 431, 444, 559, 713, 802, 803, 831, 900, 938, 986, 1002, 1008

Africa–Angola. 64, 167, 538, 559, 622

Africa–Benin (Bénin in French; Dahomey before 1975; Part of French West Africa from 1904-1960). 167, 430, 431, 713, 729, 760, 802, 803, 917, 951, 1190, 1534, 1655

Africa–Botswana (Bechuanaland until 1966). 713, 729, 760, 803, 900

Africa–Burkina Faso (Upper Volta before 4 Aug. 1984). 559, 713, 729, 760, 802, 803, 831, 900, 917, 1008, 1092, 1126, 1190, 1313, 1534, 1655

Africa–Burundi (Part of the Belgian trust territory of Ruanda-Urundi or Belgian East Africa until 1962). 559, 713, 729, 760, 802, 803, 989, 1008, 1534, 1655

Africa–Cameroon (Spelled Kamerun from 1884-1916; Cameroun in French). 559, 713, 729, 760, 802, 803, 831, 900, 917, 1008, 1029, 1092, 1110, 1190, 1669

Africa–Cape Verde or Cape Verde Islands (Ilhas do Cabo Verde. República de Cabo Verde). 559, 760

Africa–Central African Republic (République Centrafricaine; Part of Ubangi-Shari-Chad from 1906-1910. Then Ubangi-Shari or Oubangui-Chari. Part of French Equatorial Africa from 1910-1960. Called Central African Empire from 1976-1979; Centrafrique in French). 167, 559, 639, 713, 729, 760, 803, 1190

Africa–Chad. 713, 729

Africa–Comoros, Federal Islamic Republic of the. *Isles Comores* in French. Also called Comoro Islands. Includes the islands of Great Comoro *(Grande Comore)*, Anjouan, Mayotte {a French Overseas Territorial Collective since 1976}, and Mohéli. 1190

Africa–Congo (formerly Zaire). Officially Democratic Republic of the Congo (DRC). Also known as Congo-Kinshasa. Named Zaire from Oct. 1971 to May 1997. Named Congo Free State from 1855-1908, Belgian Congo *(Congo Belge* in French) from 1908-1960, Republic of the Congo from 1960 to 1964, then Democratic Republic of the Congo from 1964-1971. 379, 385, 422, 427, 497, 523, 538, 559, 592, 660, 713, 729, 760, 802, 803, 831, 857, 900, 938, 986, 1008, 1029, 1098, 1110, 1534, 1559, 1630, 1655

Africa–Congo Republic (Officially Republic of the Congo or People's Republic of the Congo. Also known as Congo-Brazzaville. Called Middle Congo {Moyen-Congo} from about 1880 to 1960. Part of French Equatorial Africa from 1910 to 1958). 951

Africa–Cote d'Ivoire (Ivory Coast until Oct. 1985; Part of French West Africa from 1895-1959). 430, 431, 713, 729, 737, 760, 802, 803, 917, 951, 1029, 1098, 1110, 1126, 1147, 1190, 1534, 1655

Africa–Egypt. Named United Arab Republic (UAR) from 1958-1971. 235, 313, 321, 332, 379, 385, 427, 428, 430, 431, 496, 497, 559, 620, 691, 698, 713, 729, 760, 802, 803, 831, 857, 877, 900, 928, 938, 986, 1008, 1029, 1083, 1110, 1126, 1143, 1147, 1195, 1237, 1275, 1534, 1655

Africa–Eritrea (Part of Ethiopia PDR from 1952 to May 1993). 385, 559

Africa–Ethiopia (Including Eritrea in Ethiopia PDR from 1952 to May 1993. Formerly Part of Italian East Africa). 385, 507, 559, 691, 713, 729, 738, 760, 763, 802, 803, 822, 831, 857, 900, 928, 938, 986, 989, 1008, 1110, 1190, 1534, 1655

Africa–Gabon (Part of French Equatorial Africa from 1910 to 1958). 559, 713, 729, 803, 900, 1008, 1029, 1110, 1534, 1655

Africa–Gambia (The). Includes Senegambia. 256, 258, 321, 387, 422, 496, 497, 559, 713, 729, 760, 802, 938, 986

Africa–Ghana (Gold Coast before 1957). 321, 387, 422, 430, 431, 497, 541, 559, 571, 691, 713, 729, 760, 802, 803, 831, 900, 938, 986, 989, 1008, 1029, 1110, 1630

Africa–Guinea (French Guinea before 1958; Guinée in French; Part of French West Africa from 1895-1958). 64, 167, 427, 760, 986, 1190

Africa–Guinea-Bissau (Portuguese Guinea before Sept. 1974). 1008

Africa–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain African country. Soybeans as such have not yet been reported in this country. 559, 713

Africa–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain African country. Soybeans as such had not yet been reported by that date in this country. 559, 713

Africa–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain African country. 81, 340, 379, 385, 387, 431, 802, 803, 831, 1008, 1630

Africa–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain African country. 81, 340, 350, 379, 385, 387, 431, 639, 802, 803, 831, 1008

Africa–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain African country. 81, 385, 387, 431, 802, 803, 831, 1008, 1190, 1630

Africa–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain African country. 81, 385, 387, 431, 639, 802, 803, 831, 1008, 1190

Africa–Kenya (British East Africa Protectorate from 1895. Renamed Kenya Protectorate in 1920). 387, 523, 559, 569, 691, 713, 729, 760, 763, 822, 938, 989, 1630

Africa–Lesotho (Basutoland before 1966). Constitutional Monarchy Surrounded by South Africa. 387, 559, 713, 729, 760, 802, 803, 1008, 1630

Africa–Liberia. 559, 661, 713, 729, 760, 831, 1008, 1110, 1534, 1655

Africa–Libya (Including Tripoli, Tripolitania, and Cyrenaica; Also Spelled Libia). 379, 385, 559, 938, 1008

Africa–Madagascar (Malagasy Republic or Republique Malgache before 1975). 64, 167, 385, 444, 507, 713, 729, 760, 917, 938, 1008, 1029, 1110, 1190, 1655, 1709

Africa–Malawi (Nyasaland from 1891-1964). 387, 559, 713, 900, 938, 986, 1630

Africa–Mali (Part of French West Africa from 1895-1960. Senegal & Sudanese Republic from June 20 to August 20, 1960. Formerly also called French Sudan *(Soudan français*, created on 18 Aug. 1890) and Upper Senegal-Niger *(Haute-Sénégal et Niger))*. 350, 379, 444, 713, 729, 760, 802, 803, 917, 1008, 1190

Africa–Mauritania, Islamic Republic of (Part of French West Africa from 1904-1960). 713, 729, 760

Africa–Mauritius (Ile Maurice, Including Rodriguez, in the Mascarene Islands, 450 Miles East of Madagascar). 256, 258, 321, 385, 387, 559, 760, 802, 831, 938, 1008, 1029, 1630

Africa–Morocco, Kingdom of (Including Western Sahara. Divided into French Morocco and Spanish Morocco from 1912-1956). 357, 379, 385, 427, 430, 431, 444, 538, 559, 675, 713, 729, 760, 763, 822, 831, 900, 986, 1002, 1008, 1029, 1110, 1143, 1534, 1655

Africa–Mozambique (Moçambique; Portuguese East Africa before 1975). 269, 559, 622, 938, 1008, 1029, 1669

Africa–Namibia (German South-West Africa from 1885 to 1915, and South-West Africa from 1919 to 1966 as a mandate of the Union of South Africa. Namibia came into popular use in 1966 and became official in March 1990). 1630

Africa–Niger (Part of French West Africa from 1904-1959). 713, 729, 760, 802, 803, 831, 1190, 1630

Africa–Nigeria, Federal Republic of. 321, 387, 422, 430, 431, 496, 497, 507, 523, 538, 559, 569, 579, 580, 639, 646, 675, 698, 713, 729, 738, 758, 760, 763, 803, 822, 857, 868, 917, 938, 939, 987, 989, 1080, 1081, 1083, 1126, 1143, 1147, 1190, 1238, 1320, 1534, 1630, 1655, 1669, 1709

Africa–Reunion (Réunion is a Department of France, in the Mascarene Islands, 425 Miles East of Madagascar). 167, 385, 427, 444, 802, 917, 938, 951, 1029, 1190

Africa–Rwanda (Part of the Belgian trust territory of Ruanda-Urundi or Belgian East Africa until 1962). 538, 559, 713, 729, 760, 802, 831, 900, 986, 989, 1008, 1029, 1110, 1190, 1534, 1655, 1669, 1709

Africa–Senegal (Part of French West Africa from 1895-1959. Sénégal & Sudanese Republic from June 20 to August 20, 1960. Includes Senegambia). 167, 427, 713, 729, 760, 802, 831, 900, 903, 917, 1029, 1063, 1098, 1190

Africa–Seychelles, Republic of. 387, 729, 760

Africa–Sierra Leone. 321, 387, 422, 559, 691, 713, 729, 760, 802

Africa–Somalia. (Formed in 1960 by the Union of British Somaliland and Italian Somaliland. Formerly Part of Italian East Africa). 559, 691, 729, 760, 803, 831, 900, 986, 1008, 1029, 1110

Africa–South Africa, Republic of (Including four former Homelands–Bophuthatswana, Transkei, Venda, and Ciskei). Named Union of South Africa from May 1910 to May 1961. 64, 81, 164, 172, 256, 258, 283, 312, 319, 321, 324, 347, 379, 385, 387, 422, 427, 428, 430, 431, 438, 473, 482, 497, 507, 521, 522, 523, 538, 559, 579, 603, 635, 639, 642, 646, 698, 730, 738, 857, 884, 938, 939, 989, 1080, 1083, 1110, 1143, 1179, 1294, 1320, 1534, 1604, 1611, 1655, 1662, 1669, 1676, 1677, 1678, 1680, 1689, 1706, 1709

Africa–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 507, 660, 857, 1098, 1143, 1313, 1534, 1655

Africa–Sudan (Anglo-Egyptian Sudan from 1899-1956). 167, 350, 379, 385, 387, 427, 580, 628, 661, 691, 713, 729, 760, 803, 831, 900, 928, 938, 939, 986, 1008, 1029, 1110

Africa–Swaziland, Kingdom of (Independent Kingdom Inside South Africa; Formerly Also Spelled Swazieland). 559, 713, 729, 802, 803, 831, 1029, 1092, 1110, 1630

Africa–Tanzania, United Republic of (Formed the Bulk of German East Africa 1895-1946. Tanganyika existed 1920-1961. Created in 1964 by Merger of Tanganyika and Zanzibar). 340, 387, 555, 559, 569, 579, 580, 591, 628, 661, 675, 691, 713, 729, 747, 758, 760, 763, 802, 803, 804, 822, 831, 857, 900, 938, 989, 1008, 1110, 1126, 1190, 1534, 1630, 1655

Africa–Togo (Togoland until 1914). 430, 431, 713, 729, 760, 802, 803, 831, 917, 938, 951, 1190, 1312

Africa–Tunisia. 379, 385, 427, 430, 431, 444, 559, 713, 760

Africa–Uganda. 340, 387, 559, 763, 803, 822, 857, 989, 1534, 1630, 1655, 1669

Africa–Zambia (Northern Rhodesia from 1899-1964). 253, 387, 427, 430, 431, 559, 569, 628, 713, 729, 802, 803, 831, 900, 986, 1008, 1029, 1081, 1092, 1110, 1143, 1190, 1312, 1534, 1630, 1655, 1669, 1709

Africa–Zimbabwe (Southern Rhodesia from 1923-1970, Rhodesia from 1970-79). 253, 313, 379, 385, 387, 427, 430, 431, 514, 523, 538, 555, 559, 622, 628, 660, 729, 738, 802, 803, 831, 900, 986, 989, 1008, 1029, 1081, 1083, 1092, 1098, 1110, 1143, 1190, 1296, 1534, 1630, 1655, 1669, 1709

Ag Processing Inc a cooperative (AGP). 1061

Agricultural Experiment Stations in the United States. 126, 127, 135, 172, 192, 405, 482, 549, 622, 661, 744, 793, 1179, 1286

Agricultural Research Service of USDA. *See* United States Department of Agriculture (USDA)–Agricultural Research Service (ARS)

Agronomy, soybean. *See* Cultural Practices, Soybean Production

Aihara, Herman and Cornellia–Their Life and Work with Macrobiotics. 683, 1348

Ajinomoto Co. Inc. (Tokyo, Japan). 632, 1201

Akwarius Almere. *See* Manna Natural Foods (Amsterdam, The Netherlands)

Albert's Tofuhaus (Lautersheim, Germany). Formerly named Albert Hess Tofuhaus Rittersheim, Tofuhaus Tiefenthal, and Das Tofuhaus. 1027, 1213

Alcohol and vegetarianism. *See* Vegetarianism and the Temperance Movement

Alfa-Laval (Lund, Sweden). 1016, 1130, 1229, 1238, 1598

Alfalfa Sprouts *(Medicago sativa)*. 1188

Alfalfa or Lucerne / Lucern *(Medicago sativa)*–Other Uses for Human Food or Drink, Including Tea, Flour, Tablets, and Leaf Protein Concentrate (LPC). See Also Alfalfa Sprouts. 717

Alfalfa or Lucerne / Lucern *(Medicago sativa)*. 64, 255, 311, 318, 320, 487, 992, 1108, 1188, 1500

Alkaline food, ash, reaction, or balance in diet and health. *See* Nutrition–Acid-Base Balance

Allergies. *See* Nutrition–Biologically Active Phytochemicals–Allergens

Allied Mills, Inc. Including (by July 1929) American Milling Co. (Peoria, Illinois) and Wayne Feed Mills (Chicago, Peoria, or Taylorville, Illinois). 1061

Allis-Chalmers Manufacturing Co. (Milwaukee, Wisconsin). Made Farm Equipment (Tractors, Combines) and Soybean Processing Equipment (Driers, Rolling and Flaking Mills, Solvent Extraction Units). 673

Almond Milk and Cream. See also: Almonds Used to Flavor Soymilk, Rice Milk, etc. 565

Almond Oil. 122, 132

Almonds Used to Flavor Commercial Soymilk, Soy Ice Cream, Soy Cheese, Amazake, Rice Milk, or Other Commercial Non-Dairy Products. 1112

Almonds *(Prunus dulcis* syn. *P. amygdalus)*–Especially Origin and Early History of the Almond. Including Almond Bread, Almond Meal, and Almonds Seasoned with Soy Sauce / Tamari. 64, 311

Alpro (Wevelgem, Belgium), Including the Provamel and Belsoy Brands Sold in Health Foods Stores. 1166, 1278, 1327, 1713

Alternative medicine. *See* Medicine–Alternative

Aluminum in Soybeans and Soyfoods. 1574

Amaranth, Grown for Grain / Seed *(Amaranthus hypochondriacus, A. caudatus,* and *A. cruentus.* Genus formerly spelled *Amarantus)*. 1023

Amazake. *See* Rice Milk (Non-Dairy)

American Milling Co. *See* Allied Mills, Inc.

American Miso Co. (Rutherfordton, North Carolina). 1614

American Philosophical Society (Philadelphia). *See* Franklin, Benjamin

American Soy Products (Michigan). *See* Natural Foods Distributors and Manufacturers in the USA–Eden Foods

American Soy Products (Saline, Michigan). Started Nov. 1986. 1166, 1713

American Soybean Association (ASA)–Activities in the United States and Canada, and General Information (Headquarters in St. Louis, Missouri. Established 3 Sept. 1920. Named National Soybean Growers' Association until 1925). 1047

American Soybean Association (ASA)–Activities, Offices, and Influence in Asia. 541, 842

American Soybean Association (ASA)–American Soybean Institute (1969-1973), an Industry-Wide Association. 620

American Soybean Association (ASA)–Funding and Fundraising Before Checkoff Program or 1971. Voluntary or from USDA (FAS or ARS). 620

American Soybean Association (ASA)–Meetings / Conventions (Annual) and Meeting Sites. 192

American Soybean Association (ASA)–Periodicals, Including Soybean Digest, Proceedings of the American Soybean Assoc., Soybean Blue Book, Soya Bluebook, Late News, etc. 857, 1098, 1143, 1605

American Soybean Association (ASA)–Soybean Council of America (June 1956-1969). Replaced by American Soybean Institute (Est. 11 July 1969). 541, 583, 608, 620

American Soybean Association (ASA)–State Soybean Associations and Boards (Starting with Minnesota in 1962). 1447

American Soybean Association (ASA)–State Soybean Associations and United Soybean Board–Activities Related to Food Uses of Soybeans / Soyfoods, or Soy Nutrition, in the United States (Not Including Soy Oil or Edible Oil Products). 857, 1447, 1498, 1499

American Soybean Association (ASA)–Strayer. *See* Strayer Family of Iowa

American Soybean Association (ASA)–United Soybean Board (USB, Established 1991, Chesterfield, Missouri). 1663

American Soybean Association (ASA) or United Soybean Board–Activities Related to Food Uses of Soybeans / Soyfoods, or Soy Nutrition, Outside the United States (Not Including Soy Oil). 541

Amino Acids and Amino Acid Composition and Content. See also Nutrition–Protein Quality; Soy Sauce, HVP Type. 468, 481, 565, 592, 733, 818, 820, 1023, 1201, 1202, 1363, 1559

Anatomy, soybean. *See* Soybean–Morphology, Structure, and Anatomy

Andreas Family of Minnesota and Iowa–Incl. Reuben Peter Andreas, and his sons Albert, Glenn, Dwayne (1918-), and Lowell Andreas (1922-). 677, 1180, 1278

Ang-kak. *See* Rice, Red Fermented

Animal Rights / Liberation (Including Protection and Cruel Treatment of Animals). 719, 1672

Animal welfare. *See* Vivisection

Antarctica. 227

Antinutritional Factors (General). See also: Allergens, Estrogens, Goitrogens, Hemagglutinins (Lectins), Trypsin / Protease Inhibitors. See also: Phytic Acid. 1169, 1200, 1336, 1341, 1370, 1546, 1548

Antioxidants and Antioxidant Activity (Especially in Soybeans and Soyfoods). 1396

Antivitamin Activity and Antivitamins (Substances in Raw Soybeans Which Can Destroy Vitamins A, B-12, D, E, and K). 1336

Appliances. *See* Blender, Juicer

Appropriate Foods, Inc. (Brooklyn, New York). Founded by Robert Werz and David Sibek in Nov. 1980. Incl. Tempeh Brothers and Soy Source. 1020, 1055

APV Systems, Soya Technology Division. Named Danish Turnkey Dairies Ltd., Soya Technology Division until 1987 (Aarhus, Denmark; DTD / STS). 1045, 1130, 1154, 1229, 1278

Aquaculture. *See* Fish or Crustaceans (e.g. Shrimp) Fed Soybean Meal Using Aquaculture or Mariculture

Archaeology and Archaeological Discoveries of Soybeans or Soyfoods. 1191

Archer Daniels Midland Co. (ADM) (Decatur, Illinois; Minneapolis, Minnesota until 1969). 677, 689, 698, 707, 877, 879, 942, 1027, 1044, 1045, 1047, 1050, 1061, 1180, 1213, 1219, 1224, 1237, 1265, 1275, 1278, 1296, 1327, 1430, 1463, 1522, 1540, 1543, 1546, 1549, 1584, 1602, 1679

Argentina. *See* Latin America, South America–Argentina

Arkady, British. *See* British Arkady Co. Ltd.

Arlington Experimental Farm. *See* United States Department of Agriculture (USDA)–Arlington Experimental Farm

Arrowhead Mills (Hereford, Deaf Smith County, Texas). 683

Asgrow (Des Moines, Iowa). Incl. Associated Seed Growers, Inc. Acquired in Feb. 1997 by Monsanto Co. from Empresas La Moderna, S.A. (ELM). 1507

Asia (General, Including East, Southeast, South, Middle East, and Central). 60, 430, 742, 789, 857, 894, 989, 1330, 1331, 1350, 1407, 1444, 1535, 1540, 1602

Asia, Central–Kazakhstan / Kazakstan (Formerly Kazakh SSR, a Central Asian Soviet Republic from 1917 to Dec. 1991). 1002, 1313

Asia, Central–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 1313

Asia, Central–Turkistan / Turkestan. Its Western Part (Russian Turkestan or West Turkestan) late 1800s to 1924. Its Eastern Part (Chinese Turkestan, Kashgaria, or East Turkestan) 1700s to ca. 1884, when it Became Sinkiang. 430

Asia, Central–Turkmenistan (Formerly Turkmen SSR, a Central Asian Soviet Republic from 1917 to Dec. 1991). 1002

Asia, Central–Uzbekistan (Formerly Uzbek SSR, a Central Asian Soviet Republic from 1917 to Dec. 1991). 1002

Asia, East (General). 102, 119, 235, 311, 529, 698, 741, 744, 803, 955, 1008, 1014, 1068, 1186, 1211, 1465, 1669, 1677

Asia, East–China (People's Republic of China; Including Tibet, Zhonghua Renmin Gonghe Guo). 49, 62, 64, 76, 78, 81, 94, 95, 103, 122, 129, 132, 137, 147, 152, 193, 194, 196, 217, 218, 224, 235, 246, 251, 267, 291, 296, 304, 307, 312, 313, 314, 321, 323, 325, 328, 332, 347, 350, 374, 379, 380, 385, 386, 402, 403, 406, 407, 422, 427, 428, 430, 473, 496, 497, 509, 510, 553, 559, 592, 597, 637, 646, 660, 698, 700, 718, 738, 762, 786, 796, 822, 857, 939, 955, 968, 985, 987, 989, 1002, 1014, 1020, 1023, 1055, 1080, 1081, 1083, 1110, 1115, 1141, 1147, 1151, 1161, 1167, 1168, 1179, 1195, 1201, 1238, 1242, 1243, 1247, 1251, 1286, 1291, 1296, 1312, 1320, 1330, 1340, 1381, 1388, 1424, 1442, 1446, 1447, 1457, 1463, 1492, 1514, 1535, 1555, 1560, 1594, 1597, 1611, 1662, 1685, 1695, 1703, 1706, 1710

Asia, East–China–Chinese Restaurants Outside China, or Soy Ingredients Used in Chinese-Style Recipes, Food Products, or Dishes outside China. 134

Asia, East–China–Shennong / Shên Nung / Shen Nung–The Heavenly Husbandman and Mythical Early Emperor of China. 307, 347, 403, 428, 583

Asia, East–China–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 321, 347, 402, 597, 857, 1151, 1331, 1424, 1560

Asia, East–Hong Kong Special Administrative Region (British Colony until 1 July 1997, then returned to China). 256, 258, 291, 506, 559, 645, 743, 935, 1014, 1016, 1058, 1080, 1093, 1114, 1130, 1134, 1172, 1179, 1237, 1240, 1275, 1296, 1322, 1339, 1340, 1442, 1446, 1447, 1463, 1514, 1555, 1594, 1597, 1611, 1685, 1695, 1703, 1706, 1710, 1713

Asia, East–Japan (Nihon or Nippon). 64, 66, 70, 71, 73, 74, 76, 84, 95, 97, 118, 119, 124, 125, 129, 130, 137, 150, 152, 167, 173, 175, 181, 185, 187, 188, 189, 190, 192, 193, 197, 198, 199, 217, 218, 222, 227, 235, 249, 253, 256, 258, 273, 291, 296, 304, 308, 312, 313, 321, 323, 325, 326, 328, 340, 347, 348, 350, 357, 367, 373, 380, 385, 386, 402, 403, 405, 406, 422, 427, 428, 430, 438, 471, 496, 497, 506, 509, 521, 522, 549, 557, 559, 589, 592, 597, 625, 637, 642, 662, 683, 697, 698, 711, 717, 718, 724, 731, 732, 738, 743, 745, 762, 763, 764, 774, 795, 800, 804, 815, 821, 822, 857, 862, 866, 877, 885, 929, 935, 938, 955, 968, 985, 987, 989, 1014, 1020, 1030, 1034, 1044, 1048, 1055, 1080, 1081, 1083, 1088, 1097, 1106, 1115, 1126, 1141, 1142, 1147, 1151, 1161, 1166, 1170, 1172, 1179, 1180, 1195, 1196, 1200, 1201, 1202, 1204, 1205, 1206, 1207, 1220, 1225, 1230, 1233, 1237, 1243, 1272, 1276, 1279, 1286, 1291, 1294, 1295, 1296, 1299, 1303, 1312, 1320, 1322, 1330, 1396, 1424, 1457, 1459, 1488, 1492, 1496, 1498, 1514, 1535, 1536, 1555, 1560, 1566, 1594, 1597, 1599, 1611, 1615, 1617, 1621, 1625, 1641, 1713

Asia, East–Japan–Japanese Restaurants or Grocery Stores Outside Japan, or Soy Ingredients Used in Japanese-Style Recipes, Food Products, or Dishes outside Japan. 441

Asia, East–Japan–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 321, 325, 347, 597, 857, 1331, 1424, 1560

Asia, East–Korea (North and South; Formerly Also Spelled Corea and Called "Chosen" by the Japanese [1907-1945]). 94, 103, 117, 188, 192, 217, 218, 235, 249, 296, 313, 321, 325, 340, 385, 402, 405, 406, 422, 428, 430, 496, 497, 506, 559, 608, 645, 713, 729, 738, 743, 760, 763, 802, 822, 857, 900, 938, 986, 987, 989, 1008, 1014, 1029, 1048, 1081, 1083, 1093, 1110, 1126, 1147, 1151, 1161, 1172, 1179, 1229, 1237, 1275, 1286, 1296, 1312, 1320, 1406, 1424, 1492, 1535, 1560, 1594, 1611, 1625, 1641

Asia, East–Korea–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 325, 857, 1151, 1331, 1424, 1560

Asia, East–Macao / Macau (Portuguese Colony, then Overseas Territory. Returned to China in 1999). 559, 713, 1339, 1340, 1442

Asia, East–Manchuria (Called Manchukuo by Japanese 1932-45; The Provinces of Heilongjiang [Heilungkiang], Jilin [Kirin], and Liaoning Were Called Northeast China after 1950). 94, 103, 170, 192, 193, 196, 202, 203, 206, 207, 222, 231, 232, 235, 237, 246, 249, 253, 256, 258, 291, 296, 302, 312, 313, 321, 323, 325, 332, 340, 347, 348, 350, 373, 379, 380, 385, 402, 403, 405, 406, 407, 422, 427, 428, 430, 438, 496, 497, 507, 738, 1081, 1083, 1179, 1320

Asia, East–Manchuria–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 321, 332, 347, 402

Asia, East–Manchuria. *See* South Manchuria Railway and the South Manchuria Railway Company *(Minami Manshu Tetsudo*

K.K.)

Asia, East–Mongolia (Mongol Uls; Outer and Inner Mongolia Before 1911; Outer Mongolia [Mongolian People's Republic] Thereafter). 256, 258

Asia, East–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 597, 763, 1151, 1313, 1331

Asia, East–Taiwan (Republic of China. Widely called by its Portuguese name, Formosa, from the 1870s until about 1945). 94, 103, 235, 304, 313, 321, 323, 325, 340, 348, 357, 367, 406, 430, 482, 506, 523, 553, 559, 597, 625, 639, 660, 691, 713, 738, 743, 763, 786, 795, 802, 807, 832, 843, 900, 935, 968, 985, 986, 987, 989, 1008, 1014, 1020, 1029, 1048, 1055, 1079, 1080, 1081, 1083, 1092, 1126, 1142, 1151, 1152, 1160, 1190, 1195, 1200, 1220, 1240, 1243, 1276, 1280, 1286, 1295, 1296, 1312, 1320, 1344, 1381, 1457, 1459, 1477, 1514, 1555, 1597, 1611, 1630, 1641, 1657

Asia, East–Taiwan–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 597

Asia, East–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1151

Asia, East. *See* Chinese Overseas, Especially Work with Soya (Including Chinese from Taiwan, Hong Kong, Singapore, etc.), Japanese Overseas, Especially Work with Soya, Koreans Overseas, Especially Work with Soya

Asia, Middle East–Afghanistan, Islamic State of. 496, 497, 559, 691, 713, 760, 802, 986, 1029

Asia, Middle East–Bahrain, State of (Also spelled Bahrein). 313, 325, 938

Asia, Middle East–Cyprus. 385, 387, 1029, 1110

Asia, Middle East–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain Middle Eastern country. Soybeans as such have not yet been reported by that date in this country. 506, 559, 938

Asia, Middle East–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain Middle Eastern country. Soybeans as such had not yet been reported by that date in this country. 506, 559, 938

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Middle Eastern country. 379, 385, 387, 497, 691

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain Middle Eastern country. 385

Asia, Middle East–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Middle Eastern country. 379, 385, 387, 497

Asia, Middle East–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Middle Eastern country. 379, 387, 497, 691

Asia, Middle East–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Middle Eastern country. 379, 387, 497

Asia, Middle East–Iran, Islamic Republic of (Jomhori-e-Islami-e-Irân; Persia before 1935). 313, 325, 430, 559, 608, 620, 660, 691, 741, 743, 763, 802, 803, 857, 900, 938, 1083, 1110, 1535, 1678, 1680

Asia, Middle East–Iraq (al Jumhouriya al 'Iraqia). 559, 691, 713, 743, 803, 900, 935, 938, 986, 1008

Asia, Middle East–Israel and Judaism (State of Israel, Medinat Israel; Established May 1948; Including West Bank, Gaza Strip, and Golan Heights Since 1967). 379, 385, 521, 522, 534, 541, 559, 628, 713, 729, 760, 802, 803, 831, 833, 1039, 1114, 1200, 1294, 1312, 1320, 1611, 1648, 1658, 1663

Asia, Middle East–Jordan, Hashemite Kingdom of (Transjordan until 1949). 559, 691, 713, 729, 760, 802, 803, 938

Asia, Middle East–Kuwait (Dowlat al-Kuwait). 938, 1611

Asia, Middle East–Lebanon (al-Jumhouriya al-Lubnaniya). 559, 713, 802

Asia, Middle East–Oman, Sultanate of (Saltanat 'Uman). 559, 938

Asia, Middle East–Palestine (Divided between Israel and Jordan in 1948-49). 379, 385, 387, 427, 713, 729, 760

Asia, Middle East–Qatar, State of (Dawlet al-Qatar; Also called Katar). 938

Asia, Middle East–Saudi Arabia, Kingdom of (al-Mamlaka al-'Arabiya as-Sa'udiya). 506, 741, 743, 802, 803, 831, 900, 935, 938, 1008, 1029, 1296

Asia, Middle East–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 660, 857, 1313, 1424, 1560

Asia, Middle East–Syria (Syrian Arab Republic; Including Latakia, Alawiya, and Territory of the Alaouites). 319, 691, 713, 986, 1313

Asia, Middle East–Turkey (Including Anatolia or Asia Minor). 385, 427, 559, 620, 660, 713, 729, 763, 857, 900, 928, 986, 1008, 1029, 1081, 1083, 1098, 1110, 1147, 1195

Asia, Middle East–United Arab Emirates (Formerly Trucial States or Trucial Oman; Also Dubai). 938, 1294, 1611

Asia, Middle East–Yemen (Formed in May 1990 by the Merger of Pro-Soviet South Yemen [People's Democratic Republic of

Yemen, Including Aden] and Pro-Western North Yemen [Yemen Arab Republic]). 325, 691, 713, 729, 760, 938

Asia, Middle East, Mideast, or Near East (General). 529, 698, 719, 734, 741, 805, 822, 848, 857, 989, 1014, 1048, 1424, 1560, 1594, 1625, 1641

Asia, South (Indian Subcontinent). 119, 741, 857, 1014, 1068, 1186, 1424, 1560

Asia, South–Bangladesh, People's Republic of (East Bengal [See India] from 1700s-1947, and East Pakistan [See Pakistan] from 1947-1971). 95, 256, 258, 379, 385, 507, 643, 650, 651, 713, 714, 729, 743, 802, 803, 831, 900, 928, 986, 989, 1008, 1022, 1029, 1080, 1081, 1098, 1110, 1126, 1620, 1680

Asia, South–Bhutan, Kingdom of. 385, 1008, 1535

Asia, South–India (Bharat, Including Sikkim, and Andaman and Nicobar Islands). 64, 81, 94, 95, 103, 116, 122, 132, 175, 200, 235, 253, 256, 258, 273, 310, 311, 321, 332, 340, 379, 383, 385, 386, 387, 402, 403, 406, 419, 427, 428, 430, 438, 487, 496, 497, 506, 507, 521, 522, 538, 559, 569, 583, 592, 597, 622, 637, 646, 647, 662, 681, 683, 691, 698, 713, 718, 727, 729, 731, 738, 739, 743, 745, 760, 763, 786, 802, 803, 804, 807, 822, 830, 832, 843, 868, 900, 938, 939, 970, 987, 989, 1008, 1014, 1020, 1023, 1055, 1080, 1081, 1083, 1084, 1098, 1126, 1147, 1151, 1191, 1195, 1200, 1205, 1237, 1238, 1243, 1312, 1320, 1535, 1559, 1561, 1658, 1662, 1670, 1678, 1680, 1681, 1711

Asia, South–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning South Asia. 175, 1008

Asia, South–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain South Asian country. 95

Asia, South–Nepal, Kingdom of. 385, 559, 637, 713, 729, 760, 763, 802, 803, 822, 831, 900, 986, 1008, 1019, 1029, 1080, 1081, 1083, 1110, 1195, 1238, 1312, 1535, 1630

Asia, South–Pakistan, Islamic Republic of (Part of India until 1947. West Pakistan 1947-1971). 95, 175, 256, 258, 379, 385, 387, 507, 559, 603, 622, 639, 691, 698, 713, 729, 743, 802, 803, 831, 900, 986, 1008, 1029, 1080, 1110, 1147, 1151, 1535

Asia, South–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 727, 857, 1313, 1424, 1560

Asia, South–Sri Lanka, Democratic Socialist Republic of (Ceylon before 22 May 1972. Serendib was the ancient Arabic name). 246, 251, 258, 313, 325, 350, 357, 367, 379, 385, 387, 406, 427, 430, 538, 559, 691, 713, 727, 729, 743, 760, 763, 786, 802, 803, 822, 831, 855, 868, 896, 900, 928, 939, 957, 986, 989, 1008, 1020, 1055, 1080, 1081, 1092, 1110, 1151, 1195, 1312, 1320, 1457, 1535

Asia, Southeast (General). 155, 741, 796, 841, 931, 938, 1008, 1014, 1060, 1126, 1130, 1151, 1152, 1186, 1201, 1321, 1429, 1505, 1527

Asia, Southeast–Brunei (State of Brunei Darussalam; Part of British Borneo before 1984). 1008

Asia, Southeast–Cambodia, Kingdom of (Kampuchea from 1979 to the 1980s; Also Khmer Republic). 167, 235, 313, 379, 385, 430, 444, 559, 660, 729, 760, 1312, 1381, 1535

Asia, Southeast–Indonesia (Netherland(s) Indies, Netherlands East Indies, or Dutch East Indies before 1945) (Including Islands of Java, Borneo, Celebes, Lesser Sunda, Moluccas, New Guinea [West Irian], and Sumatra). 105, 167, 175, 235, 273, 304, 313, 321, 325, 340, 347, 379, 385, 387, 402, 406, 422, 427, 428, 431, 438, 470, 473, 496, 497, 559, 597, 632, 645, 652, 691, 698, 713, 718, 729, 738, 739, 743, 745, 760, 763, 786, 788, 797, 802, 803, 804, 813, 817, 822, 826, 830, 831, 832, 841, 842, 843, 868, 900, 931, 935, 987, 989, 1008, 1014, 1020, 1029, 1037, 1049, 1055, 1056, 1080, 1081, 1083, 1092, 1110, 1147, 1151, 1186, 1190, 1197, 1204, 1286, 1296, 1312, 1320, 1344, 1381, 1457, 1493, 1502, 1529, 1535, 1594, 1611, 1625, 1641

Asia, Southeast–Indonesia–Indonesian Restaurants Outside Indonesia, or Soy Ingredients Used in Indonesian-Style Recipes, Food Products, or Dishes Outside Indonesia. 632

Asia, Southeast–Indonesia–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 325, 347, 402, 739, 857, 1424, 1560

Asia, Southeast–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning Southeast Asia. 95

Asia, Southeast–Introduction of Soybeans to. Earliest document seen concerning soybeans (but only wild perennial relatives of soybeans) in a certain Southeast Asian country; cultivated soybeans have not yet been reported. 94, 103

Asia, Southeast–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Southeast Asian country. 167

Asia, Southeast–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Southeast Asian country. 235

Asia, Southeast–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Southeast Asian country. 235

Asia, Southeast–Laos. 379, 385, 444, 559, 713, 727, 729, 760, 1110, 1381, 1535

Asia, Southeast–Malaysia, Federation of (Including East Malaysia Composed of Sarawak and Sabah. British Borneo or North Borneo from about 1881 to 1963). Federation of Malaya before 1963. 102, 313, 321, 324, 325, 379, 385, 387, 427, 430, 523, 559, 632, 639, 645, 682, 691, 713, 729, 743, 763, 782, 786, 822, 831, 841, 842, 900, 938, 939, 986, 1008, 1014, 1023, 1037, 1081, 1110, 1147, 1233, 1238, 1296, 1312, 1320, 1457, 1594, 1611, 1625, 1641

Asia, Southeast–Myanmar / Burma. Officially Union of Myanmar. 95, 175, 256, 258, 312, 321, 379, 385, 387, 430, 496, 497, 506, 507, 559, 622, 763, 822, 986, 1029, 1083, 1110, 1535

Asia, Southeast–Philippines, Republic of the. 62, 94, 103, 217, 321, 323, 340, 357, 385, 422, 427, 428, 430, 431, 438, 496, 497, 506, 507, 553, 559, 645, 691, 713, 729, 738, 739, 743, 745, 760, 763, 786, 795, 802, 803, 804, 822, 830, 831, 842, 900, 968, 985, 986, 989, 1001, 1008, 1014, 1037, 1081, 1083, 1110, 1126, 1147, 1151, 1200, 1220, 1243, 1280, 1286, 1312, 1320, 1344, 1381, 1457, 1535, 1594, 1611, 1625, 1641

Asia, Southeast–Singapore (Part of the Straits Settlements [British] from 1826 to 1946). 217, 291, 313, 324, 325, 387, 430, 632, 645, 713, 716, 729, 743, 760, 763, 822, 841, 842, 935, 1014, 1037, 1080, 1114, 1134, 1147, 1238, 1294, 1322, 1339, 1340, 1514, 1555, 1594, 1597, 1611, 1625, 1641, 1713

Asia, Southeast–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 597, 660, 682, 727, 857, 1313, 1424, 1560

Asia, Southeast–Thailand, Kingdom of (Siam before 1938). 273, 313, 325, 383, 385, 427, 428, 430, 496, 497, 507, 538, 559, 597, 632, 646, 647, 691, 743, 745, 763, 773, 799, 802, 803, 804, 822, 830, 831, 841, 842, 880, 900, 938, 986, 989, 1008, 1014, 1029, 1037, 1052, 1068, 1080, 1081, 1083, 1092, 1110, 1151, 1238, 1275, 1276, 1296, 1312, 1320, 1330, 1331, 1455, 1457, 1535, 1538, 1594, 1611, 1625, 1640, 1641, 1694

Asia, Southeast–Timor-Leste (East Timor). 325, 938

Asia, Southeast–Vietnam, Socialist Republic of (North and South) (Divided by French into Tonkin, Annam, and Cochinchine from 1887-1945). 167, 175, 218, 235, 291, 313, 321, 379, 385, 406, 428, 430, 444, 496, 497, 559, 661, 662, 683, 691, 713, 727, 729, 760, 763, 822, 989, 1008, 1014, 1029, 1051, 1081, 1083, 1110, 1211, 1312, 1381, 1457, 1505, 1535

Asia, Southeast. *See* Indonesians Overseas, Especially Work with Soya, Vietnamese Overseas, Especially Work with Soya

Asia, Transcaucasia–Azerbaijan (Azerbaijani Republic; Formerly Azerbaijan SSR, a Transcaucasian Soviet Republic from 1917 to Dec. 1991. Also spelled Azerbaidzhan, Aderbijan). 1313

Asia, Transcaucasia–Georgia, Republic of (Formerly Georgian SSR, a Transcaucasian Soviet Republic from 1921 to Dec. 1991). 1002, 1313

Asian Vegetable R&D Center (AVRDC, Taiwan). 711, 738, 743, 753, 757, 769, 847, 860, 987, 1008, 1080, 1081, 1126, 1151, 1195, 1312, 1330, 1457, 1630

Asparagus bean. *See* Yard-Long Bean or Asparagus Bean

Aspergillus oryzae. *See* Koji, Miso, or Soy Sauce

Associated Seed Growers, Inc. *See* Asgrow (Des Moines, Iowa)

Atlantic Ocean islands. *See* Oceania

Auenland Tofu und Soja Produkte (Prien-Chiemsee, Germany). Started by Peter Wiegand in March 1982. 886, 898, 943, 944, 945, 946, 947, 948, 949, 954, 956, 975, 982, 995, 1000, 1027, 1210, 1213, 1214, 1231, 1236, 1239, 1241, 1592

Australasia. *See* Oceania

Australia. *See* Oceania–Australia

AVRDC (Taiwan). *See* International Soybean Programs

Agricultural Economics, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Agricultural Economics

Azuki Bean–Etymology of These Terms and Their Cognates/ Relatives in Various Languages. 74

Azuki Bean. *Vigna angularis* (Willd.) Ohwi & H. Ohashi. Also called Adzuki, Aduki, Adsuki, Adzinki, Red Bean, Chinese Red Bean, Red Mung Bean, Small Red Bean. Japanese–Kintoki, Komame, Shôzu. Chinese–Xiaodou, Chixiaodou, Hsiao Tou [Small Bean], Ch'ih Hsiao Tou [Red Small Bean]. Former scientific names: *Phaseolus radiatus* (L.), *Dolichos angularis* (Willd.), *Phaseolus angularis* (Willd.) Wight, or *Azukia angularis* (Willd.) Ohwi. 74, 307, 318, 321

Azumaya, Inc. (Started Making Tofu in 1930 in San Francisco, California). Acquired by Vitasoy on 27 May 1993. 800, 1339, 1340

Bacon or bacon bits, meatless. *See* Meat Alternatives–Meatless Bacon, Ham, and Other Pork-related Products

Bacteria in intestines–beneficial. *See* Intestinal Flora / Bacteria

Baker, Bill (1873-1942). Health Foods Pioneer, Famous Baker, Ojai, California. 1649

Bambarra groundnuts (*Voandzeia subterranea*). Also spelled Bambara. 60, 64, 95, 104, 167, 487, 507, 538, 867

Barges used to transport soybeans. *See* Transportation of Soybeans or Soy Products to Market by Water Using Barges, Junks, etc

Barricini Foods (Mountain Lakes, New Jersey)–Soy Ice Cream Company. Acquired Farm Foods and Ice Bean on 31 May 1985. Sold Farm Foods to 21st Century in 1993. 1048

Bars–Energy Bars or Nutrition Bars Made with Soy (Not Including Frozen Dessert Bars). 1623

Bars–Nutrition Bars or Energy Bars Made with Soy–Industry and Market Statistics, Trends, and Analyses–Larger Companies. 1623

Bartram, John (1699-1777) and William (1739-1823). 1377

Battle Creek Food Co. *See* Kellogg, John Harvey (M.D.)

Battle Creek Sanitarium Health Food Co. *See* Kellogg, John Harvey (M.D.) as a Health Food Pioneer

Bean curd skin. *See* Yuba

Bean curd. *See* Tofu

Bean paste. *See* Miso

Beef alternatives. *See* Meat Alternatives–Beef Alternatives, Including Beef Jerky, etc. See also Meatless Burgers

Bees, Honeybees *(Apis mellifera)*, and Apiculture–Soy Flour Fed in Pollen Substitutes or Supplements. 461, 462, 465

Belleme, John. *See* American Miso Co. (Rutherfordton, North Carolina)

Benni, Benne, Benniseed. *See* Sesame Seed

Benzene / Benzine / Benzol solvents for extraction. *See* Solvents

Berczeller, Laszlo. 315, 347, 439

Bibliographies and / or Reviews of the Literature (Contains More Than 50 References or Citations). 172, 321, 347, 385, 402, 403, 406, 427, 430, 496, 507, 521, 522, 592, 634, 672, 673, 719, 741, 744, 758, 763, 778, 787, 793, 816, 822, 826, 839, 928, 1020, 1048, 1055, 1085, 1126, 1171, 1190, 1312, 1319, 1336, 1338, 1341, 1553, 1565, 1577, 1701, 1702

Biloxi soybean variety. *See* Soybean Varieties USA–Biloxi

Binder for Sand Foundry Cores–Industrial Uses of Soy Oil as a Drying Oil. 1047

Biographies, Biographical Sketches, and Autobiographies–See also: Obituaries. 328, 907, 1023, 1047, 1200, 1377, 1387, 1388, 1702, 1707

Biological control. *See* Integrated Pest Management (IPM)

Biotechnology applied to soybeans. *See* Genetic Engineering, Biotechnology (Biotech), and Transgenic Plants

Black Bean Sauce / Black Soybean Sauce / Soy Nugget Sauce, Made in the Kitchen by Crushing Salted, Fermented Black Soybeans, usually with Minced Ginger, Garlic, Chilis and/or Chinese-style Wine. Not a Commercial Product or an Extract. See Also Black Soybean Jiang (a Commercial Product). 788, 1445

Black Gram or Urd. *Vigna mungo*. Formerly *Phaseolus mungo*. 487, 806, 814, 838, 933, 976

Black soybean sauce. *See* Black Bean Sauce

Black soybeans. *See* Soybean Seeds–Black, Whole Dry Soybeans–Black Seeded

Black-eyed pea. *See* Cowpea–*Vigna unguiculata*

Blender, Electric (Kitchen Appliance)–Including Liquefier, Liquidizer, Liquifier, Osterizer, Waring Blender, Waring Blendor, Waring Mixer, Whiz-Mix, Vitamix–Early Records Only. 388, 565

Boca Burger Inc. Founded 1993. Acquired Feb. 2000 by Kraft Foods Inc. 1626

Boca Burger. *See* Kraft Foods Inc.

Bongkrek poisoning. *See* Toxins and Toxicity in Foods and Feeds–Bongkrek Poisoning Factors

Borden, Inc. (Columbus, Ohio; New York City, New York; Waterloo, Iowa; Elgin and Kankakee, Illinois). 609, 889, 1593

Botany–Soybean. 2, 52, 56, 60, 62, 64, 94, 103, 105, 119, 152, 155, 166, 168, 175, 321, 347, 353, 372, 385, 386, 402, 403, 430, 681, 786, 1021, 1129, 1152, 1160, 1220

Bowen, Samuel (1732-1777)–He Introduced the Soybean to North America in 1765. See also: (1) His Ancestors and Descendants. (2) James Flint. 1200, 1286, 1377, 1505, 1684

Bowen, Samuel (1732-1777)–The Ancestors, Descendants and Close Relatives of Samuel Bowen. See also: Bowen, Samuel. 1377

Boyer, Robert. *See* Ford, Henry

Brady Crop Cooker. *See* Extruders and Extrusion Cooking, Low Cost–General and Other

Bran, soy. *See* Fiber, Soy

Brassica napus (L.) var. napus. *See* Canola

Brassica napus. *See* Rapeseed

Brazil, Deforestation in. *See* Latin America, South America–Brazil, Deforestation in

Brazil. *See* Latin America, South America–Brazil

Breeding of Soybeans and Classical Genetics. 321, 379, 380, 385, 405, 569, 610, 676, 684, 723, 767, 833, 839, 968, 985, 987, 1022, 1039, 1060, 1064, 1077, 1079, 1110, 1142, 1171, 1192, 1193, 1200, 1215, 1220, 1232, 1249, 1280, 1286, 1295, 1315, 1492, 1497, 1505, 1558, 1622

Breeding of soybeans. *See* Genetic Engineering, Biotechnology (Biotech), and Transgenic Plants, Irradiation of Soybeans for Breeding and Variety Development, Variety Development and Breeding

Breeding or Evaluation of Soybeans for Seed Quality, such as Low in Trypsin Inhibitors, Lipoxygenase, Linolenic Acid, etc. 1195, 1200

Breeding soybeans for food uses. *See* Soybean Production–Variety Development, Breeding, Selection, Evaluation, Growing, or Handling of Soybeans for Food Uses

Briggs, George M. (1884-1970, Univ. of Wisconsin). 405

British Arkady Company Ltd. and British Arkady Holdings Ltd. (Manchester, England). Subsidiary of ADM of the USA. Including the Haldane Foods Group. 1275, 1278

British Columbia. *See* Canadian Provinces and Territories–British Columbia

Broad Bean. *Vicia faba* L., formerly *Faba vulgaris,* Mönch. Also called Faba Bean, Fava Bean, Horse Bean. Chinese–Candou ("silkworm bean"). Japanese–Soramame. German–Saubohne or Buschbohne. French–Grosse Fève, Fève de Marais, Féverole, Faverole, Gourgane. 307, 431, 717, 826

Brown soybeans. *See* Soybean Seeds–Brown

Buckeye Cotton Oil Co. *See* Procter & Gamble Co.

Building materials. *See* Adhesives or Glues for Plywood, Other Woods, Wallpaper, or Building Materials

Bunge Corp. (White Plains, New York). Including Lauhoff Grain Co. (Danville, Illinois) since 1979. 1061, 1663

Burgers, meatless. *See* Meat Alternatives–Meatless Burgers and Patties

Burlison, William Leonidas (1882-1958, Univ. of Illinois). 192, 405

Burma. *See* Asia, Southeast–Myanmar

Butter made from nuts or seeds. *See* Nut Butters

Butter-beans. *See* Lima Bean

Cacoja (France). *See* Sojinal / Biosoja

Cajanus cajan. *See* Pigeon Pea, Pigeonpea or Red Gram

Cake or meal, soybean. *See* Soybean Meal

Calcium Availability, Absorption, and Content of Soybeans, and Soybean Foods and Feeds. 172, 1619

Calf, Lamb, or Pig Milk Replacers. 820, 1238

California. *See* United States–States–California

Canada–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 597, 857, 1098, 1143, 1180, 1291, 1313, 1424, 1560, 1594, 1625, 1641

Canada–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 304, 313

Canada. 157, 172, 217, 253, 304, 313, 321, 323, 324, 325, 348, 373, 385, 396, 405, 418, 422, 427, 428, 438, 455, 467, 482, 497, 521, 522, 529, 542, 559, 592, 603, 642, 662, 673, 683, 697, 698, 715, 717, 730, 761, 762, 763, 764, 775, 795, 805, 822, 848, 857, 904, 929, 935, 937, 938, 989, 1002, 1020, 1041, 1048, 1055, 1080, 1081, 1083, 1092, 1093, 1094, 1098, 1126, 1134, 1143, 1147, 1149, 1157, 1167, 1170, 1172, 1179, 1180, 1195, 1205, 1206, 1225, 1286, 1291, 1294, 1303, 1313, 1314, 1320, 1339, 1340, 1424, 1442, 1446, 1447, 1463, 1465, 1481, 1495, 1514, 1516, 1534, 1550, 1555, 1556, 1560, 1561, 1587, 1588, 1590, 1591, 1594, 1596, 1598, 1604, 1611, 1623, 1625, 1626, 1627, 1641, 1644, 1646, 1650, 1655, 1657, 1659, 1662, 1675, 1677, 1678, 1679, 1681, 1691, 1692, 1700, 1705, 1708, 1709, 1712

Canadian Provinces and Territories–Alberta. 1587

Canadian Provinces and Territories–British Columbia. 217, 323, 324, 396, 455, 482, 603, 764, 1048, 1179, 1495, 1516, 1556, 1561, 1587, 1588, 1590, 1591, 1598, 1626, 1627, 1644, 1650, 1659, 1692

Canadian Provinces and Territories–Manitoba. 373, 418

Canadian Provinces and Territories–Ontario. 373, 405, 418, 422, 542, 603, 673, 717, 730, 764, 904, 929, 1002, 1048, 1080, 1157, 1179, 1339, 1446, 1561, 1587, 1590, 1594, 1625, 1627, 1641, 1646, 1659, 1675, 1681, 1691, 1692

Canadian Provinces and Territories–Québec (Quebec). 482, 1588

Canadian Provinces and Territories–Saskatchewan. 1709

Canadian soybean varieties. *See* Soybean Varieties Canada

Canavalia ensiformis. *See* Jack Bean *(Canavalia ensiformis)*

Cancer Preventing Substances in Soybeans and Soyfoods (Such as the Isoflavones Genistein and Daidzein) and Cancer Prevention. 1396, 1463

Cancer or Tumor Causing / Promoting Substances in Soybeans or Soyfoods, or Experiments Showing That Soybeans or Soyfoods May Be Carcinogenic or Mutagenic. 1125

Cancer, breast, prevention and diet. *See* Diet and Breast Cancer Prevention

Cancer, prostate, prevention and diet. *See* Diet and Prostate Cancer Prevention

Candles, Crayons, and Soybean Wax–Industrial Uses of Soy Oil as an Hydrogenated Oil. 1671

Cannabis sativa. *See* Hemp

Canola *(Brassica napus* (L.) var. *napus)*–An Improved Variety of the Rape Plant or Rapeseed Having Seeds with Little or No Erucic Acid. 857, 1176, 1424, 1560, 1589

Cape Verde. *See* Africa–Cape Verde or Cape Verde Islands (Ilhas do Cabo Verde. República de Cabo Verde)

Carbohydrates (General). See also: Starch, Dietary Fiber, and Oligosaccharides (Complex Sugars). 196, 321, 607

Carbohydrates–Dietary Fiber (Including Complex Carbohydrates, Bran, Water-Soluble and Water-Insoluble Fiber). 74, 824, 1108, 1361

Carbohydrates–Effects of Dietary Carbohydrates (Especially Fiber and Saponins) on Blood Lipids (Especially Cholesterol). 818, 824, 846, 850, 852, 1013, 1132, 1202

Carbohydrates–Glycemic Index and Glycemic Load. 1675

Cardiovascular Disease, Especially Heart Disease and Stroke, But Including Cholesterol Reduction, and Hypertension (High Blood Pressure). Soy Is Not Always Mentioned. 1629, 1652

Cargill, Inc. (Minneapolis, Minneapolis). 677, 698, 715, 942, 1061, 1671

Caribbean. *See* Latin America–Caribbean

Cartoons or Cartoon Characters. 403, 407, 433, 435

Carver, George Washington (ca. 1864-1943, Tuskegee Inst., Alabama)–Work with Soybeans, Soyfoods, Peanuts, or Chemurgy, and the Carver Laboratory in Dearborn, Michigan. 309

Casein or Caseinates–Problems in So-Called Non-Dairy Products. 1302

Catering. *See* Foodservice and Institutional Feeding or Catering

Catsup or Catchup. *See* Ketchup, Catchup, Catsup, etc. Word Mentioned in Document

Catsup. *See* Ketchup–Western-Style, Such Tomato-, Mushroom-, Walnut-, or Oyster Ketchup, etc.

Cattle, Bullocks, Bulls, Steers, or Cows for Beef / Meat or Unspecified Uses Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 95, 256, 273, 304, 341

Cauldron Foods Ltd. (Bristol, England). Owned by Rayner Burgess Ltd. Member of the Hero Group. 1027, 1278

Central America. *See* Latin America–Central America

Central Soya Co. (Fort Wayne, Indiana; Acquired in Oct. 1987 by the Ferruzzi Group in Ravenna, Italy. In 1991 became part of CSY Agri-Processing, Inc. [a holding company], operating as a member of the Eridania / Beghin-Say agro-industrial group, within Ferruzzi-Montedison). Acquired in Oct. 2002 by Bunge. 698, 733, 881, 1047, 1050, 1061, 1540

Centro Nacional de Pesquisa de Soja (National Soybean Research Center, CNPS or CNPSo). *See* Empresa Brasiliera

Ceres (Colorado Springs, Colorado). 683

Certification of soybean seeds. *See* Seed Certification (Soybeans)

Ceylon. *See* Asia, South–Sri Lanka

Cheese–Non-Soy Dairy-Based Cheeses. 889

Cheese, cream. *See* Soy Cream Cheese

Cheese. *See* Soy Cheese, Soy Cheese or Cheese Alternatives

Cheesecake or cream pie. *See* Soy Cheesecake or Cream Pie

Chemical / Nutritional Composition or Analysis (Of Seeds, Plants, Foods, Feeds, Nutritional Components, for Animals (Incl. Humans)). 74, 81, 95, 122, 132, 196, 226, 230, 235, 273, 296, 321, 406, 418, 430, 447, 587, 637, 691, 1624

Chemurgy, the Farm Chemurgic Movement, and the Farm Chemurgic Council (USA, 1930s to 1950s, Including Wheeler McMillen, William J. Hale, and Francis P. Garvan). 1047

Chenopodium quinoa Willd. *See* Quinoa

Chiang, soybean (from China). *See* Jiang–Chinese-Style Fermented Soybean Paste

Chicken, meatless. *See* Meat Alternatives–Meatless Chicken, Goose, Duck, and Related Poultry Products. See also Meatless Turkey

Chickens (esp. Layers & Broilers) Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 288, 490, 606

Chickpea / Chickpeas / Chick-Peas, Garbanzo / Garbanza Beans. *Cicer arietinum* L. Including Hummus / Hummous. 104, 114, 133, 156, 255, 388, 487, 503, 719, 826, 891, 983, 1062, 1245, 1264, 1334, 1375, 1390, 1580, 1670

Chico-San Inc. (Chico, California). Maker of Macrobiotic and Natural Foods. Founded in 1962. 557, 662, 683

China–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1151

China. *See* Asia, East–China

Chinese Medicine, Traditional, Including Heating-Cooling or Hot-Cold Foods and Medicines. 307

Chinese Overseas, Especially Work with Soya (Including Chinese from Taiwan, Hong Kong, Singapore, etc.). 102, 131, 136, 324, 355, 387, 485, 763, 822, 892, 897, 905, 963, 983, 1004, 1027, 1051, 1121, 1216, 1251, 1281, 1371, 1556

Chinese restaurants outside China, or Chinese recipes that use soy ingredients outside China. *See* Asia, East–China–Chinese Restaurants Outside China

Chocolate substitute made from roasted soybeans. *See* Soy Chocolate

Cholesterol. *See* Carbohydrates–Effects of Dietary Carbohydrates (Especially Fiber and Saponins) on Blood Lipids (Especially Cholesterol), Lipids–Effects on Blood Lipids, Protein–Effects on Blood Lipids

Chufu / Chufas *(Cyperus esculentus)*. Also Called Earth Almond, Tiger Nuts/Tigernut, Nut Grass, Ground Almond, Hognut, Earth Nut, Rush Nut, Zulu Nut. French: Souchet. German: Erdmandel. Italian: Cipero comestible. 64, 122, 132

Cicer arietinum. *See* Chickpeas or Garbanzo Beans

Civil War in USA (1861-1865). 521

Claim or Claims of Health Benefits–Usually Authorized by the U.S. Food and Drug Administration (FDA). 1577, 1598, 1615, 1623, 1626

Coconut Milk and Cream. Or Coconuts Used to Flavor Soymilk, Rice Milk, etc. 826, 977

Coffee Creamer, Whitener or Lightener (Non-Dairy–Usually Contains Soy). 1093, 1322

Coffee Substitutes or Adulterants, Non-Soy–Usually Made from Roasted Cereals, Chicory, and / or Other Legumes. 400, 589, 731, 759, 907, 1224, 1649

Coffee, soy. *See* Soy Coffee

Cognitive / Brain Function. Including Alzheimer's Disease. 1479, 1554, 1615, 1626

Coix lachryma-jobi. *See* Job's Tears

Coker Pedigreed Seed Co. (Hartsville, South Carolina). 428, 482, 1179

Color of soybean seeds. *See* Seed Color (Soybeans)–Specific Varieties), Soybean Seeds (of different colors)

Combines or Combined Harvester-Thresher–Etymology of This Term and its Cognates. 672

Combines. Also called the Combined Harvester-Thresher in the 1920s and 1930s (Combine). 331, 496, 542, 604, 649, 672, 673, 816, 933, 1541, 1557

Commercial Soy Products–New Products, Mostly Foods. 101, 368, 381, 400, 401, 409, 410, 423, 424, 432, 436, 450, 500, 508, 511, 516, 527, 528, 557, 566, 584, 614, 615, 631, 658, 659, 668, 707, 708, 709, 710, 725, 749, 754, 809, 810, 811, 825, 828, 835, 849, 853, 858, 859, 863, 875, 876, 878, 882, 883, 899, 901, 902, 905, 906, 908, 910, 911, 912, 913, 914, 922, 923, 924, 936, 941, 943, 944, 945, 946, 947, 948, 949, 950, 958, 960, 961, 962, 963, 965, 967, 969, 972, 973, 977, 978, 979, 980, 983, 984, 990, 991, 992, 994, 995, 996, 997, 1003, 1004, 1005, 1006, 1010, 1011, 1012, 1018, 1024, 1026, 1028, 1031, 1033, 1034, 1035, 1043, 1053, 1054, 1057, 1059, 1065, 1066, 1072, 1073, 1074, 1075, 1076, 1086, 1087, 1090, 1095, 1096, 1100, 1101, 1102, 1104, 1105, 1107, 1112, 1118, 1120, 1122, 1123, 1127, 1128, 1131, 1137, 1139, 1146, 1153, 1156, 1158, 1159, 1174, 1176, 1177, 1178, 1181, 1182, 1183, 1184, 1198, 1212, 1216, 1217, 1218, 1219, 1221, 1226, 1233, 1244, 1245, 1250, 1253, 1254, 1258, 1261, 1262, 1264, 1266, 1267, 1269, 1270, 1273, 1274, 1277, 1282, 1283, 1284, 1285, 1287, 1288, 1289, 1290, 1298, 1301, 1304, 1305, 1306, 1307, 1310, 1318, 1323, 1324, 1329, 1334, 1335, 1337, 1345, 1347, 1361, 1367, 1368, 1438, 1439, 1464, 1489, 1490, 1491, 1515, 1516, 1525, 1556, 1608, 1609, 1610, 1631, 1632, 1635, 1636, 1637, 1654, 1674

Commercial soy products–earliest. *See* Historical–Earliest Commercial Product

Commercial soymilk. *See* Soymilk Production–How to Make Soymilk on a Commercial Scale

Commercial tofu. *See* Tofu Production–How to Make Tofu on a Commercial Scale

Comoros. *See* Africa–Comoros, Federal Islamic Republic of the. *Isles Comores*. Comoro Islands

Component / value-based pricing of soybeans. *See* Seed Quality

Composition of soybeans, soyfoods, or feeds. *See* Chemical / Nutritional Composition or Analysis

Computerized Databases and Information Services, Information or Publications About Those Concerning Soya. 744, 1041, 1150, 1377

Computers (General) and Computer Hardware Related to Soybean Production and Marketing. See also: Computer Software. 1150

Concerns about the Safety, Toxicity, or Health Benefits of Soy in Human Diets. 1319, 1325, 1336, 1341, 1342, 1351, 1352, 1354, 1355, 1356, 1357, 1360, 1365, 1366, 1372, 1373, 1376, 1378, 1379, 1382, 1383, 1384, 1393, 1398, 1399, 1400, 1401, 1402, 1403, 1405, 1407, 1408, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1425, 1426, 1427, 1428, 1431, 1432, 1433, 1434, 1435, 1436, 1440, 1443, 1448, 1450, 1452, 1460, 1461, 1462, 1467, 1468, 1469, 1470, 1471, 1473, 1475, 1476, 1478, 1479, 1480, 1481, 1484, 1486, 1487, 1488, 1501, 1506, 1510, 1512, 1520, 1522, 1531, 1543, 1544, 1546, 1547, 1548, 1549, 1552, 1553, 1562, 1565, 1574, 1576, 1577, 1584, 1585, 1601, 1603, 1613, 1615, 1621, 1663, 1665

ContiGroup Companies, Inc. Named Continental Grain Co. until 1999 (New York, New York). 1061, 1199

Continental Grain Co. *See* ContiGroup Companies, Inc.

Cookbooks, vegan. *See* Vegetarian Cookbooks–Vegan Cookbooks

Cookbooks, vegetarian. *See* Vegetarian Cookbooks

Cookery, Cookbooks, and Recipes–Mostly Using Soy, Mostly Vegetarian. See also: the Subcategories–Vegetarian Cookbooks, Vegan Cookbooks. 72, 96, 106, 180, 184, 230, 294, 301, 317, 321, 329, 330, 339, 347, 354, 355, 386, 388, 390, 402, 403, 416, 446, 454, 458, 459, 485, 502, 505, 509, 510, 617, 632, 640, 662, 671, 707, 719, 788, 791, 826, 924, 952, 954, 988, 1058, 1062, 1103, 1106, 1163, 1223, 1235, 1255, 1257, 1317, 1362, 1495, 1502, 1523, 1528, 1537, 1555, 1575, 1581, 1582, 1599, 1607, 1638, 1640, 1642, 1664, 1667, 1675, 1682, 1707

Cooperative Enterprises, Ventures, Research, or Experiments, and Cooperatives / Co-ops, Worldwide. See also: Soybean Crushers (USA)–Cooperative Crushers. 534, 706, 775, 800, 884, 991, 995, 1015, 1047, 1151, 1185, 1195, 1238, 1293, 1449, 1591

Cooperative soybean crushers. *See* Soybean Crushers (USA), Cooperative

Corn / Maize *(Zea mays* L. subsp. *mays)*–Including Corn Oil, Corn Germ Oil, Meal, Starch, and Gluten. 128, 133, 148, 192, 370, 497, 672, 713, 715, 729, 760, 763, 822, 857, 1023, 1047, 1069, 1098, 1116, 1166, 1173, 1180, 1224, 1424, 1465, 1507, 1527, 1560, 1604, 1648, 1689

Cornell University (Ithaca, New York), and New York State Agric. Experiment Station (Geneva, NY)–Soyfoods Research & Development. 1079, 1200, 1232, 1249, 1339, 1505, 1713

Cottage cheese. *See* Dairylike Non-dairy Soy-based Products

Cotton Cloth, Fabric, Textile, Fibers or Raw Cotton in Bales, All from the Boll of the Cotton Plant *(Gossypium sp.* L.). 74, 76

Cotton Plant and Crop *(Gossypium sp.* L.). See also Cottonseed Oil, Cake, and Meal. 253, 256, 269, 326, 628

Cottonseed Meal and Cake (Defatted). Previously Spelled Cotton-Seed Cake. 222, 296, 1091

Cottonseed Oil. Previously Spelled Cotton-Seed Oil or Cotton Oil. 122, 132, 222, 286, 313, 522

Cottonseeds / Cottonseed. Previously Spelled Cotton Seeds / Seed. 122, 325, 326

Cover Crop, Use of Soybeans as. See also: Intercropping. 318

Cowpea or Black-Eyed Pea. *Vigna unguiculata* (L.) Walp. Formerly spelled Cow Pea. Also called Blackeye Pea, Pea Bean, Yardlong Cowpea. Chinese: Jiangdou. Previous scientific names: *Vigna sinensis* (L.) (1890s-1970s), *Vigna catjang* (1898-1920), *Vigna Katiang* (1889). 114, 121, 138, 139, 140, 143, 145, 148, 149, 152, 156, 159, 161, 165, 174, 190, 214, 215, 242, 248, 255, 265, 267, 268, 269, 306, 307, 316, 318, 320, 321, 335, 336, 358, 364, 365, 380, 487, 499, 520, 806, 814, 826, 855, 873, 933, 934, 1091

Cows / Cattle for Dairy Milk and Butter Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 286, 321, 385

Crayons. *See* Candles, Crayons, and Soybean Wax

Creamer or soy cream for coffee. *See* Coffee Creamer / Whitener

Crop Rotation Using Soybean Plants for Soil Improvement. 338, 380, 473, 507, 591, 653, 688, 932

Cropping Systems: Intercropping, Interplanting, or Mixed Cropping (Often Planted in Alternating Rows with Some Other Crop). 273, 496, 806, 871, 932, 976, 981, 1030, 1126, 1190

Cruets (Glass Bottles for Serving Soy Sauce–or Oil or Vinegar–at the Table) and Cruet Frames and Stands (of Plated Metal). Also spelled Crewets, Crewits, Creuits, Cruetts, Cruits. 15

Crushing statistics for soybeans, and soy oil and meal production and consumption. *See* individual geographic regions (such as Asia, Europe, Latin America, United States, World, etc.) and nations within each region

Crushing, soybean–equipment manufacturers. *See* Allis-Chalmers

CSY Agri-Processing, Inc. *See* Central Soya Co. (Fort Wayne, Indiana)

Cubbison, Sophie (1890-1982), and the Cubbison Cracker Co. of Los Angeles, California. 1649

Cultural Practices, Cultivation & Agronomy (Including Crop Management, Erosion, Planting, Seedbed Preparation, Water Management / Irrigation). 76, 95, 107, 112, 115, 190, 223, 224, 226, 243, 244, 246, 267, 269, 273, 307, 310, 321, 338, 358, 363, 373, 374, 375, 385, 386, 402, 403, 404, 428, 466, 467, 473, 496, 517, 519, 539, 572, 588, 593, 621, 627, 629, 630, 639, 656, 657, 666, 675, 695, 702, 736, 758, 770, 771, 779, 806, 839, 864, 868, 932, 964, 1071, 1080, 1126, 1151

Cultures of nitrogen fixing bacteria for soybeans. *See* Nitrogen Fixing Cultures

Cyperus esculentus. *See* Chufa. Also Called Earth Almond, Tiger Nuts, etc.

Dairy alternative, rice based. *See* Rice Milk Products–Ice Creams

Dairy alternatives (soy based). *See* Coffee Creamer / Whitener or Cream Alternative, Soy Cheese–Fermented, Soy Cheese–Non-Fermented, Soy Cheese or Cheese Alternatives, Soy Cheesecake or Cream Pie, Soy Cream Cheese, Soy Puddings, Custards, Parfaits, or Mousses, Soy Yogurt, Soymilk, Soymilk, Fermented, Tofu (Soy Cheese), Whip Topping

Dairylike Non-dairy Soy-based Products, Other (Cottage Cheese, Sour Cream, and Icing). See also Non-dairy Whip Topping, Soy Ice Cream, Soy Yogurt, Soy Cheese, Cream Cheese or Cheesecakes, Coffee Creamer / Whitener or Cream, and Sour Cream. 1006, 1102, 1182, 1239

DeKalb Genetics. Including DeKalb-Pfizer Genetics (DeKalb, Illinois) from 1982 to 1990. 1507

Death certificates. *See* Obituaries, Eulogies, Death Certificates, and Wills

Deceptive or misleading labeling or products. *See* Unfair Practices–Including Possible Deceptive / Misleading Labeling, Advertising, etc. See also: Adulteration

Deforestation in Brazil. *See* Latin America–South America–Brazil, Deforestation in

Delsoy Products, Inc. (Dearborn, Michigan). Soy Protein Company. Renamed Whitehouse Products in 1963. Purchased by C.J. Christoff & Sons in 1983 (Lowell, Michigan). Renamed Chadalee Farms, Inc. 1050, 1322

Demos, Steve. *See* White Wave, Inc. (Boulder, Colorado)

Detergents or soaps made from soy oil. *See* Soaps or Detergents

DE-VAU-GE Gesundkostwerk GmbH (Lueneburg, Germany). 877, 879, 1229, 1231, 1237, 1275, 1278, 1327, 1658, 1713

Developing countries, soybean production in. *See* Tropical and Subtropical Countries, Soybean Production in (Mostly in

Developing nations. *See* Third World

Development, sustainable. *See* World Problems–Sustainable Development and Growth

Diabetes and Diabetic Diets. 158, 245, 256, 258, 263, 277, 296, 312, 347, 386, 402, 403, 440, 1390

Diesel Fuel, SoyDiesel, Biodiesel–Interchem Industries, Inc., Interchem Environmental, Inc., Midwest Biofuels, Ag Environmental Processing (AEP), Bill Ayres and Doug Pickering. Pioneer Biodiesel Makers and Marketers in the USA. 1690

Diesel Fuel, SoyDiesel, Biodiesel–Kenlon Johannes, Pioneer in the USA. 1690

Diesel Fuel, SoyDiesel, Biodiesel, or Artificial Petroleum. 385, 844, 854, 884, 887, 921, 959, 1009, 1025, 1036, 1038, 1042, 1676, 1677, 1689, 1690

Diesel, soy. *See* National Biodiesel Board

Diet and Breast Cancer Prevention (Soy May Not Be Mentioned). 1252, 1396, 1447, 1463, 1466, 1526, 1537, 1540

Diet and Prostate Cancer Prevention (Soy May Not Be Mentioned). 1396, 1466, 1537, 1540

Directories–Soybean Processors (Including Soyfoods Manufacturers), Researchers, Conference Attendees, and Other Names and Addresses Related to Soyfoods, Vegetarianism, Macrobiotics, etc. See also Directories–Japanese American in USA. 356, 385, 391, 662, 683, 743, 805, 826, 841, 842, 848, 857, 928, 937, 1000, 1048, 1081, 1092, 1098, 1126, 1143, 1424, 1514, 1555, 1560, 1597, 1617

Diseases of Soybeans (Bacterial, Fungal, and Viral / Virus). See also: Nematode Disease Control. 95, 256, 258, 321, 340, 385, 386, 402, 403, 405, 428, 473, 483, 489, 496, 523, 594, 653, 692, 703, 704, 711, 723, 739, 740, 744, 746, 747, 748, 750, 753, 757, 758, 769, 774, 790, 807, 808, 814, 819, 823, 827, 834, 838, 839, 840, 847, 860, 861, 868, 873, 896, 917, 919, 920, 933, 985, 1126, 1190, 1193, 1280, 1312, 1321, 1429, 1646, 1666

Diseases, pests, and other types of injury, plant protection from. *See* Plant Protection from Diseases, Pests and Other Types of Injury (General)

Diseases, plant protection from. *See* Soybean Rust

District of Columbia. *See* United States–States–District of Columbia

Documents with More Than 20 Keywords. 64, 74, 81, 94, 95, 103, 122, 132, 167, 172, 192, 217, 218, 235, 253, 256, 258, 273, 296, 304, 307, 310, 312, 313, 321, 323, 325, 326, 340, 347, 357, 373, 374, 379, 380, 385, 386, 387, 402, 403, 405, 406, 407, 418, 422, 427, 428, 430, 431, 438, 467, 473, 482, 496, 497, 506, 507, 521, 522, 538, 559, 565, 589, 592, 597, 639, 640, 642, 662, 683, 691, 698, 713, 719, 729, 738, 743, 760, 763, 764, 800, 802, 803, 822, 826, 831, 857, 868, 879, 900, 917, 938, 942, 986, 987, 989, 1000, 1008, 1014, 1020, 1023, 1027, 1029, 1047, 1048, 1055, 1061, 1081, 1083, 1088, 1092, 1110, 1126, 1147, 1151, 1166, 1179, 1180, 1190, 1195, 1200, 1201, 1205, 1213, 1224, 1237, 1238, 1275, 1278, 1286, 1294, 1296, 1312, 1313, 1320, 1322, 1339, 1340, 1463, 1514, 1537, 1560, 1594, 1598, 1604, 1611, 1625, 1626, 1641, 1713

Domestication of the soybean. *See* Origin, Domestication, and Dissemination of the Soybean (General)

Drackett Co. (The) (Cincinnati and Sharonville [or Evendale], Ohio). 1047

Dried-frozen tofu. *See* Tofu, Frozen or Dried-Frozen

Drying of soybeans. *See* Storage of Seeds

DTD–Danish Turnkey Dairies. *See* APV Systems, Soya Technology Division

DuPont (E.I. Du Pont de Nemours & Co., Inc.) and DuPont Agricultural Enterprise / Products (Wilmington, Delaware). Formerly spelled Du Pont. 1047, 1578, 1600, 1648

Dutch East India Company (VOC; *Vereenigde Ost-Indische Compagnie)*. 1680

Earliest commercial soy products. *See* Historical–Earliest Commercial Product

Earliest document seen... *See* Historical–Earliest Document Seen

Economic Research Service of USDA. *See* United States Department of Agriculture (USDA)–Economic Research Service (ERS)

Economics of soybean production and hedging. *See* Marketing Soybeans

Edamame–imports, exports, international trade. *See* Green Vegetable Soybeans–Imports, Exports, International Trade

Edamamé. *See* Green Vegetable Soybeans, Green Vegetable Soybeans–Edamamé

Eden Foods, Inc. (Clinton, Michigan; Founded 4 Nov. 1969) and American Soy Products (Saline, Michigan; Founded Aug. 1986). 683, 1166, 1299, 1465, 1588, 1713

Edible Soy Products, makers of Pro-Nuts (Hudson, Iowa). *See* Solnuts B.V.

Edible or food-grade soybeans. *See* Green Vegetable Soybeans–Vegetable-Type, Garden-Type, or Edible Soybeans

Efficiency of animals in converting feeds into human foods. *See* Feeds–Efficiency

Efficiency of plants vs. animals in producing food. *See* Vegetarianism–Efficiency of Plants... in Producing Food

Egypt. *See* Africa–Egypt

Ehret, Arnold (1866-1922). Pioneer in Fasting and Vegetarianism in Germany, Switzerland, and the United States (Los Angeles). 603

El Molino Mills (Los Angeles Area. Founded by Edward Allen Vandercook. Began Operations on 1 March 1926 in Alhambra, California). 1649

Embargoes, tariffs, duties. *See* Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums

Empresa Brasileira de Pesquisa Agropecuaria (Brazilian Enterprise for Research on Management of Land for Animal Production; EMBRAPA) (Brazil). Established 26 April 1973. Includes Centro Nacional de Pesquisa de Soja (National Soybean Research Center; CNPS or CNPSo). 1538, 1709

Energy bars. *See* Bars–Energy Bars or Nutrition Bars Made with Soy

Energy, renewable, from soybeans. *See* Diesel Fuel, SoyDiesel, or Biodiesel. See also: Petroleum, Artificial

England. *See* Europe, Western–United Kingdom

Environmental issues, concerns, and protection. *See* Vegetarianism, the Environment, and Ecology

Enzyme active soy flour. *See* Soy Flour, Grits, and Flakes–Enzyme Active

Enzymes–Commercial Enzyme Preparations Used in Making Soyfoods by Hydrolyzing or Modifying Soy Protein, Carbohydrates, or Lipids (Including Phosphatides). 1050, 1242

Enzymes Produced During Fermentations Involving Koji or *Aspergillus Oryzae* (Including Enzymes in Miso and Fermented Soy Sauce). 1166

Enzymes in Soybean Seeds–Lipoxygenase (Formerly Called Lipoxidase) and Its Inactivation. 500, 592, 725, 888, 1007, 1047, 1200, 1363, 1560, 1713

Enzymes in Soybean Seeds–Other. 321, 607, 1111, 1238

Enzymes in Soybean Seeds–Urease and Its Inactivation. 290, 337, 1200

Equipment for Soybean Processing (Not Including Farm Machinery). 1161

Equipment for making tofu. *See* Tofu Equipment

Erewhon (Boston, Massachusetts). Founded April 1966 by Aveline and Michio Kushi in Boston. Merged with U.S. Mills in 1986. 557, 662, 683, 1088, 1294, 1297, 1348

Erewhon–Los Angeles / West. Established Sept. 1969. Purchased from Erewhon (Boston) by John Fountain & John Deming on 1 Aug. 1975, then Broken Up and Re-Sold in 1979. Part Became Erewhon West. 662

Ernst, Andrew H. (1796-1860)–Pioneer Horticulturalist and Nurseryman of Cincinnati, Ohio. 787

Essene Traditional Foods (Philadelphia, Pennsylvania). 662

Estrogens (in Plants–Phytoestrogens, Especially in Soybeans and Soyfoods), Including Isoflavones (Including Genistein, Daidzein, Glycetein, Coumestrol, Genistin, and Daidzin). 382, 513, 550, 590, 1188, 1251, 1308, 1336, 1338, 1341, 1342, 1351, 1352, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1364, 1365, 1369, 1370, 1373, 1383, 1384, 1391, 1393, 1395, 1396, 1397, 1398, 1399, 1401, 1402, 1405, 1407, 1411, 1412, 1413, 1414, 1416, 1417, 1418, 1419, 1420, 1421, 1423, 1426, 1428, 1432, 1433, 1434, 1435, 1437, 1440, 1443, 1447, 1448, 1452, 1461, 1463, 1466, 1467, 1468, 1469, 1472, 1473, 1474, 1475, 1476, 1479, 1480, 1483, 1485, 1486, 1488, 1498, 1499, 1501, 1503, 1506, 1508, 1517, 1518, 1519, 1521, 1526, 1528, 1531, 1532, 1537, 1540, 1543, 1544, 1546, 1547, 1548, 1549, 1551, 1552, 1553, 1560, 1562, 1564, 1565, 1569, 1570, 1571, 1572, 1573, 1574, 1576, 1577, 1578, 1584, 1585, 1586, 1589, 1593, 1595, 1600, 1602, 1606, 1607, 1613, 1615, 1616, 1621, 1629, 1642, 1652, 1653, 1660, 1663, 1667, 1675

Ethanol (ethyl alcohol). *See* Solvents

Etymology of the Word "Soy" and its Cognates / Relatives in English. 1463

Etymology of the Word "Soyfoods" and its Cognates / Relatives in Various Languages. 475, 826

Etymology of the Words "Soya," "Soy," and "Soybean" and their Cognates / Relatives in Various Languages. 64, 80, 104, 132, 152, 211, 307, 321, 374, 385, 386, 850, 1126

Etymology. *See* the specific product concerned (e.g. soybeans, tofu, soybean meal, etc.)

Euronature (Paris, France). *See* Lima N.V. / Lima Foods (Sint-Martens-Latem, Belgium; and Mezin, France)

Europe, Eastern (General). 529, 608, 698, 857, 939, 987, 1001, 1594, 1625, 1641

Europe, Eastern–Albania (Republika e Shqipërisë / Shqiperia). 1313

Europe, Eastern–Bosnia and Herzegovina (Declared Independence from Yugoslavia on 29 Feb. 1992). 1313

Europe, Eastern–Bulgaria. 422, 427, 430, 438, 496, 497, 597, 738, 1048, 1081, 1083, 1320

Europe, Eastern–Croatia (Hrvatska; Declared Independence from Yugoslavia on 21 June 1991; Includes Istria or Istrian Peninsula and Rijeka (formerly Fiume)). 430, 1313

Europe, Eastern–Czech Republic (Ceská Republika; Including Bohemia or Cechy, and Moravia or Morava. From 1918 until 1 Jan. 1993, Western Part of Czechoslovakia, which also included Slovakia or Slovensko). 357

Europe, Eastern–Czechoslovakia (From 1918 until 1 Jan. 1993; then divided into The Czech Republic [formerly Bohemia and Moravia], and Slovakia [officially "The Slovak Republic"]). 357, 385, 406, 422, 428, 438, 496, 497, 559, 597, 831, 986, 1008, 1081, 1147, 1294, 1320, 1604

Europe, Eastern–Estonia (Formerly Estonian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991; Also Spelled Esthonia). 313, 325, 422

Europe, Eastern–Hungary (Magyar Köztársaság). 82, 321, 357, 385, 430, 438, 496, 497, 521, 522, 559, 698, 738, 802, 803, 900, 1081, 1083, 1147, 1294

Europe, Eastern–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning Eastern Europe. 1313

Europe, Eastern–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Eastern European country. 422

Europe, Eastern–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Eastern European country. 422

Europe, Eastern–Latvia (Formerly Latvian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991). 422, 1002

Europe, Eastern–Lithuania (Formerly Lithuanian SSR, a Soviet Republic from Aug. 1940 to Aug. 1991). 1002

Europe, Eastern–Macedonia (Formerly Yugoslav Republic of Macedonia. Officially Republika Makedonija. Declared Independence from Yugoslavia on 8 Sept. 1991). 1313

Europe, Eastern–Moldova (Moldavia until Aug. 1991; Formerly Moldavian SSR, a Soviet Republic from 1917 to 26 Dec. 1991). 497, 1002, 1313

Europe, Eastern–Poland. 321, 357, 385, 406, 422, 427, 430, 438, 482, 496, 497, 521, 522, 559, 698, 803, 900, 1081, 1147, 1179, 1200, 1294

Europe, Eastern–Romania (Including Moldavia and Bessarabia until 1940-44). 304, 313, 357, 385, 422, 428, 430, 438, 496, 497, 559, 738, 1081, 1083, 1092

Europe, Eastern–Russia (Russian Federation; Formerly Russian SFSR, a Soviet Republic from 1917 to Dec. 1991). 94, 103, 235, 253, 296, 304, 313, 325, 340, 386, 387, 402, 403, 422, 430, 438, 497, 597, 635, 738, 1002, 1081, 1179, 1313, 1320, 1561, 1611

Europe, Eastern–Serbia and Montenegro (Named Yugoslavia before 13 March 2002). Composed of Serbia and Montenegro (Plus Autonomous Provinces of Vojvodina and Kosovo) since 17 April 1992. 325

Europe, Eastern–Slovakia (Slovak Republic, or Slovensko; Eastern Part of Czechoslovakia from 1918 until 1 Jan. 1993). 357

Europe, Eastern–Slovenia (Slovenija; Declared Independence from Yugoslavia on 21 June 1991). 430, 1313

Europe, Eastern–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 438, 597, 857, 1313, 1534

Europe, Eastern–USSR (Union of Soviet Socialist Republics or Soviet Union; called Russia before 1917. Ceased to exist in Dec. 1991). 304, 313, 321, 325, 340, 385, 386, 387, 402, 403, 406, 422, 427, 428, 430, 438, 496, 497, 521, 522, 597, 635, 697, 698, 718, 738, 795, 822, 857, 987, 1001, 1002, 1081, 1083, 1134, 1147, 1179, 1180, 1204, 1312, 1320, 1350

Europe, Eastern–Ukraine (Ukrayina; Formerly Ukranian SSR, a Soviet Republic from 1917 to Dec. 1991). 422, 430, 497, 1002, 1313

Europe, Eastern–Yugoslavia. Composed of Serbia and Montenegro from 17 April 1992 to 13 March 2002. From 1918-1991 included the 6 Republics of Serbia / Servia, Croatia, Bosnia and Herzegovina, Slovenia, Macedonia, and Montenegro. Included Carnaro, Fiume / Rijeka / Rieka 1947-1992; Formerly Also Spelled Jugoslavia. See also Serbia and Montenegro. 313, 325, 422, 427, 430, 438, 496, 497, 559, 677, 697, 802, 803, 900, 1029, 1048, 1081, 1083, 1110, 1114, 1147, 1294, 1313, 1320, 1534

Europe, Western–Andorra, Principality of. 1294

Europe, Western–Austria (Österreich). 235, 296, 319, 321, 340, 357, 385, 386, 402, 403, 406, 422, 430, 438, 496, 497, 521, 522, 559, 683, 1000, 1027, 1081, 1147, 1210, 1231, 1294, 1320, 1594, 1611, 1625, 1641

Europe, Western–Belgium, Kingdom of. 235, 296, 321, 357, 379, 385, 422, 427, 497, 521, 522, 559, 662, 683, 764, 775, 795, 935, 938, 942, 1000, 1027, 1088, 1092, 1205, 1231, 1294, 1320, 1327, 1594, 1611, 1625, 1641, 1713

Europe, Western–Denmark (Danmark; Including the Province of Greenland [Kalaallit Nunaat]). 209, 235, 296, 300, 304, 313, 321, 325, 347, 357, 402, 418, 422, 427, 430, 521, 522, 589, 635, 662, 683, 764, 775, 877, 879, 1027, 1154, 1205, 1237, 1268, 1275, 1299, 1320, 1594, 1611, 1625, 1641

Europe, Western–Finland (Suomen Tasavaltu). 357, 521, 522, 559, 1114, 1147, 1149, 1205, 1237, 1251, 1275, 1294, 1396, 1611

Europe, Western–France (République Française). 76, 82, 99, 107, 122, 132, 167, 217, 222, 235, 296, 307, 310, 313, 321, 325, 326, 347, 350, 357, 372, 373, 379, 385, 386, 402, 403, 406, 422, 427, 428, 430, 438, 444, 466, 497, 521, 522, 557, 559, 589, 635, 639, 662, 683, 697, 698, 737, 738, 764, 770, 771, 775, 787, 795, 802, 803, 831, 900, 917, 935, 942, 951, 986, 987, 989, 1000, 1008, 1027, 1029, 1063, 1081, 1083, 1084, 1092, 1142, 1147, 1166, 1185, 1187, 1190, 1205, 1206, 1220, 1237, 1238, 1243, 1272, 1294, 1295, 1302, 1320, 1377, 1560, 1594, 1611, 1625, 1641

Europe, Western–Germany (Deutschland; Including East and West Germany, Oct. 1949–July 1990). 2, 97, 119, 172, 218, 222, 235, 239, 260, 275, 276, 286, 292, 296, 300, 307, 313, 321, 325, 347, 357, 373, 382, 383, 385, 386, 402, 403, 405, 406, 422, 427, 428, 430, 431, 438, 439, 442, 453, 471, 521, 522, 559, 589, 635, 642, 662, 681, 683, 697, 698, 732, 764, 775, 795, 877, 879, 898, 935, 937, 938, 943, 944, 945, 946, 947, 948, 949, 954, 956, 975, 982, 989, 995, 1000, 1002, 1027, 1047, 1081, 1098, 1147, 1161, 1202, 1205, 1206, 1210, 1213, 1214, 1229, 1230, 1231, 1236, 1237, 1238, 1239, 1241, 1275, 1320, 1327, 1514, 1555, 1559, 1560, 1592, 1594, 1611, 1625, 1628, 1641, 1658, 1671, 1673, 1676, 1678, 1713

Europe, Western–Greece (Hellenic Republic–Elliniki Dimokratia–Hellas. Including Crete, Kríte, Kriti, or Creta, and Epirus or Epeiros). 430, 438, 559, 1023, 1081

Europe, Western–Iceland (Lydhveldidh or Lyoveldio Island). 1294

Europe, Western–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain western European country. Soybeans as such have not yet been reported in this country. 559

Europe, Western–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain Western European country. Soybeans as such had not yet been reported by that date in this country. 559

Europe, Western–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Western European country. 438

Europe, Western–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Western European country. 310, 373

Europe, Western–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Western European country. 310, 373

Europe, Western–Ireland, Republic of (Éire; Also Called Irish Republic). 313, 319, 325, 683, 775, 1000, 1205, 1242, 1294, 1302

Europe, Western–Italy (Repubblica Italiana). 218, 235, 296, 304, 310, 311, 312, 313, 321, 325, 340, 357, 385, 386, 402, 403, 406, 422, 427, 428, 430, 438, 507, 529, 538, 559, 635, 647, 662, 683, 697, 698, 715, 764, 775, 802, 803, 831, 900, 935, 987, 1000, 1027, 1061, 1081, 1147, 1150, 1179, 1199, 1205, 1294, 1320, 1331, 1594, 1611, 1625, 1641

Europe, Western–Luxembourg, Grand Duchy of (Occasionally spelled Luxemburg). 313, 325, 559, 795, 974, 1205

Europe, Western–Malta. 713

Europe, Western–Netherlands, Kingdom of the (Koninkrijk der Nederlanden), Including Holland. 105, 235, 273, 296, 300, 304, 313, 321, 323, 325, 328, 347, 357, 379, 385, 402, 406, 422, 427, 428, 430, 438, 470, 475, 496, 497, 515, 521, 522, 559, 635, 642, 662, 683, 764, 775, 868, 935, 937, 938, 942, 953, 1000, 1020, 1027, 1047, 1048, 1055, 1098, 1147, 1161, 1203, 1205, 1206, 1213, 1231, 1237, 1291, 1302, 1320, 1514, 1555, 1559, 1593, 1594, 1597, 1602, 1611, 1625, 1641, 1658, 1671, 1680, 1711

Europe, Western–Norway, Kingdom of (Kongeriket Norge). 235, 313, 325, 347, 402, 422, 521, 522, 635, 683, 1147, 1237, 1275, 1294, 1594, 1625, 1641

Europe, Western–Portugal (República Portuguesa: Including Macao / Macau {Until 1999} and the Azores). 313, 319, 325, 357, 427, 538, 622, 662, 683, 713, 732, 764, 803, 831, 900, 986, 1008, 1027, 1029, 1081, 1110, 1294, 1339, 1340, 1442, 1447, 1463, 1560, 1594, 1625, 1641

Europe, Western–Scotland (Part of United Kingdom). 235, 319, 328, 357, 373, 662, 938, 1000, 1360, 1430, 1561, 1627

Europe, Western–Soybean Crushing–Soy Oil and Meal Production and Consumption–Statistics, Trends, and Analyses. 209

Europe, Western–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 682, 857, 1313

Europe, Western–Spain, Kingdom of (Reino de España). 312, 319, 357, 385, 427, 428, 559, 662, 682, 683, 697, 698, 764, 802, 803, 820, 900, 938, 942, 1027, 1081, 1147, 1237, 1253, 1294, 1299, 1320, 1560, 1594, 1611, 1625, 1641

Europe, Western–Sweden, Kingdom of (Konungariket Sverige). 1, 123, 235, 296, 304, 313, 321, 325, 347, 357, 422, 427, 430, 438, 455, 496, 497, 521, 522, 642, 662, 683, 697, 738, 764, 987, 1000, 1016, 1027, 1114, 1130, 1147, 1152, 1205, 1213, 1237, 1268, 1275, 1294, 1320, 1531, 1598, 1611

Europe, Western–Switzerland (Swiss Confederation). 2, 200, 201, 321, 357, 385, 406, 430, 453, 559, 589, 662, 683, 743, 1000, 1027, 1231, 1236, 1237, 1238, 1241, 1259, 1294, 1320, 1611

Europe, Western–United Kingdom of Great Britain and Northern Ireland (UK–Including England, Scotland, Wales, Channel Islands, Isle of Man, Gibraltar). 1, 25, 60, 62, 64, 74, 76, 81, 85, 94, 95, 103, 116, 122, 123, 132, 153, 188, 195, 201, 206, 207, 209, 218, 222, 224, 226, 229, 235, 249, 253, 256, 258, 261, 264, 273, 274, 275, 276, 286, 287, 296, 299, 304, 307, 309, 311, 312, 313, 315, 319, 321, 324, 325, 332, 339, 347, 357, 373, 375, 376, 385, 386, 387, 402, 403, 405, 406, 418, 419, 422, 426, 427, 428, 438, 453, 521, 522, 524, 541, 555, 559, 564, 581, 589, 595, 600, 605, 623, 628, 632, 635, 638, 640, 662, 673, 677, 681, 683, 697, 698, 717, 719, 730, 731, 732, 743, 764, 775, 795, 798, 868, 877, 879, 892, 931, 935, 937, 938, 953, 989, 1000, 1027, 1048, 1051, 1061, 1081, 1084, 1085, 1088, 1092, 1106, 1119, 1147, 1150, 1154, 1191, 1199, 1205, 1206, 1213, 1219, 1233, 1237, 1255, 1275, 1278, 1286, 1294, 1320, 1322, 1327, 1339, 1340, 1349, 1360, 1364, 1365, 1370, 1371, 1377, 1384, 1385, 1386, 1391, 1393, 1395, 1414, 1423, 1430, 1467, 1477, 1498, 1519, 1558, 1561, 1562, 1573, 1574, 1584, 1585, 1590, 1593, 1601, 1603, 1611, 1618, 1627, 1640, 1663, 1664, 1671, 1672, 1680

Europe, Western. 137, 218, 296, 496, 506, 529, 549, 625, 642, 698, 734, 761, 762, 763, 775, 805, 822, 848, 857, 889, 894, 955, 989, 1014, 1020, 1041, 1055, 1058, 1141, 1167, 1170, 1195, 1200, 1201, 1207, 1225, 1272, 1303, 1350, 1507, 1578, 1623, 1626

Europe, soyfoods associations in. *See* Soyfoods Associations in Europe

Europe, soyfoods movement in. *See* Soyfoods Movement in Europe

Evans Seed Co. (West Branch, Ogemaw County, Michigan) and Mr. Edward Ellsworth Evans (1864-1928). 373, 1179

Exercise. *See* Physical Fitness, Physical Culture, and Exercise

Expellers. *See* Soybean Crushing–Equipment–Screw Presses and Expellers

Experiment stations (state) in USA. *See* Agricultural Experiment Stations in the United States

Explosives Made from Glycerine–Industrial Uses of Soy Oil as a Non-Drying Oil. 350, 407

Exports. *See* Trade of Soybeans, Oil & Meal, or see Individual Soyfoods Exported

Extruders and Extrusion Cooking, Low Cost–General and Other, Including Brady Crop Cooker, Thriposha, etc. 842, 877, 879, 989

Extruders and Extrusion Cooking, Low Cost–Including Triple "F" Inc., Insta-Pro International, Soy Innovations International, and Heartland Agri Partners, LLC. 1686

Extruders and Extrusion Cooking. See also: Low Cost Extrusion Cookers (LECs). 642, 698, 841, 842, 894

Faba bean or fava bean. *See* Broad Bean *(Vicia faba)*

Family history. *See* Genealogy and Family History

Far-Mar-Co, Inc. (A Cooperative; Hutchinson, Kansas). Created on 1 June 1968 by the merger of four regional grain cooperatives including Farmers Union CMA, which had owned the former Dannen soybean crushing plant in St. Joseph, Missouri, since Sept. 1963. Parts later sold to PMS Foods, Inc. 1047

Farm (The) (Summertown, Tennessee). See also Soyfoods Companies (USA)–Farm Food Co. 763, 1048

Farm Food Co. (San Rafael, then San Francisco, California), Farm Foods, and Farm Soy Dairy (Summertown, Tennessee). Div. of Hain Food Group (Uniondale, New York). Merged with Barricini Foods on 31 May 1985. Acquired by 21st Century Foods from Barracini Foods in mid-1993. 1048, 1213

Farm machinery. *See* Tractors

Farmers Union Grain Terminal Association (GTA). Established in 1938 in St. Paul, Minnesota. 677

Fasting pioneers. *See* Ehret, Arnold

Feeds–Efficiency of Animals in Converting Feeds into Human Foods. 826

Feeds–Soybeans, soybean forage, or soy products fed to various types of animals. *See* The type of animal–chickens, pigs, cows, horses, etc.

Feeds / Forage from Soybean Plants–Hay (Whole Dried Soybean Plants, Foliage and Immature Seed Included). 95, 121, 190, 256, 269, 321, 338, 496, 539, 1179

Feeds / Forage from Soybean Plants–Pasture, Grazing or Foraging. 214, 269, 321, 338, 374, 385

Feeds / Forage from Soybean Plants–Pastures & Grazing–Hogging Down / Off, Pasturing Down, Grazing Down, Lambing Down / Off, and Sheeping-Down / Off. 128, 321

Feeds / Forage from Soybean Plants–Silage / Ensilage Made in a Silo. 133, 141, 148, 159, 192, 248, 321, 370, 374, 385, 539

Feeds / Forage from Soybean Plants–Soilage and Soiling (Green Crops Cut for Feeding Confined Animals). 321

Feeds / Forage from Soybean Plants–Straw (Stems of Whole Dried Soybean Plants). Also Fertilizing Value, Other Uses, Yields, and Chemical Composition. 295

Feeds / Forage from Soybean Plants or Full-Fat Seeds (Including Forage, Fodder [Green Plants], or Ground Seeds). 115, 126, 127, 135, 142, 152, 157, 175, 223, 226, 240, 241, 246, 253, 257, 258, 261, 265, 267, 273, 283, 296, 313, 322, 338, 341, 343, 345, 358, 363, 386, 402, 403, 406, 428, 467, 490, 497, 507, 544, 569, 694, 699, 839, 909

Feeds Made from Soybean Meal (Defatted). 95, 286, 296, 312, 549, 592, 606, 608, 698, 719, 1040, 1091, 1116

Fermented Soyfoods and Their Fermentation (General). See also: Microbiology and Bacteriology–History of Early Discoveries. 817

Fermented Specialty Soyfoods–Soy Wine, Cantonese Wine Starter (Kiu-Tsee / Tsée), Soy Fermentation Pellicle or Bean Ferment (Tou Huang), Meitauza (Mei-Tou-Cha), Soyidli, Dosa / Dosai, Dhokla, and Soy Ogi. 307, 430, 763, 822, 826

Fermented black beans (dow see). *See* Soy Nuggets

Fermented tofu. *See* Tofu, Fermented

Fermented whole soybeans. *See* Natto, Dawa-dawa, Kinema, Thua-nao

Fertilizer, soybean meal used as. *See* Soybean Meal / Cake, Fiber (as from Okara), or Shoyu Presscake as a Fertilizer or Manure for the Soil

Fertilizers / Fertilizer (Incl. Foliar Sprays), Fertilization, Plant Nutrition, Mineral Needs, and Nutritional / Physiological Disorders of Soybeans (Including Chlorosis). 272, 496, 628, 639, 720, 1173, 1190

Fiber–Okara or Soy Pulp–Etymology of This Term and Its Cognates / Relatives in Various Languages. 430

Fiber–Okara or Soy Pulp, Used as an Ingredient in Commercial Soyfood Products. 828, 912, 978, 980, 994, 1003, 1018, 1066, 1117, 1183, 1274, 1298, 1310

Fiber–Okara or Soy Pulp, from Making Soymilk or Tofu–Value Added Uses (Not Including Livestock Feeds) and Solutions to Disposal Problems. 898, 1500

Fiber–Okara or Soy Pulp, from Making Soymilk or Tofu. 321, 430, 763, 822, 826, 845, 868, 890, 898, 975, 1099, 1117, 1196, 1239, 1343, 1451, 1500, 1575, 1659, 1670, 1673

Fiber–Presscake, Residue or Dregs from Making Soy Sauce. 74, 76

Fiber–Seventh-day Adventist Writings or Products (Especially Early) Related to Dietary Fiber. 1223, 1224, 1390, 1589, 1607

Fiber, Soy–Bran (Pulverized Soybean Hulls / Seed Coats) and Other Uses of Soybean Hulls. 321, 1304

Fiber, Soy–Bran–Etymology of This Term and Its Cognates / Relatives in Various Languages. 321

Fiber, Soy–General, for Food Use (Specific Type Unknown). 1363, 1589

Fiber, Soy–Okara, Soy Bran (from Pulverized Soybean Hulls, or Isolate Fiber)–Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1066

Fiber. *See* Carbohydrates–Dietary Fiber

Fibers (Artificial Wool or Textiles Made from Spun Soy Protein Fiber, Including Azlon, Soylon, and Soy Silk / Soysilk)–Industrial Uses of Soy Proteins. 385, 438, 1047

Fiji. *See* Oceania–Fiji

Fish or Crustaceans (e.g., Shrimp) Fed Soybean Meal or Oil as Feed Using Aquaculture or Mariculture. 1141

Fish, meatless. *See* Meat Alternatives–Meatless Fish, Shellfish, and Other Seafood-like Products

Fitness. *See* Physical Fitness, Physical Culture, and Exercise

Flakes, from whole soybeans. *See* Whole Soy Flakes

Flatulence or Intestinal Gas–Caused by Complex Sugars (As the Oligosaccharides Raffinose and Stachyose in Soybeans), by Fiber, or by Lactose in Milk. 440, 1078, 1188, 1238

Flavor Problems and Ways of Solving Them (Especially Beany Off-Flavors in Soy Oil, Soymilk, Tofu, Whole Dry Soybeans, or Soy Protein Products, and Ways of Masking or Eliminating Them). 496, 643, 799, 880, 888, 1007, 1221, 1238, 1305, 1306, 1363, 1389, 1390, 1463, 1556, 1588, 1590, 1591, 1598, 1713

Flax plant or flaxseed. *See* Linseed Oil, Linseed Cake / Meal, or the Flax / Flaxseed Plant

Flint, James. Translator, Agent and Resident Administrator (Supercargo) in China of the East India Company (England) in the Late 1700s. Died 1793. Chinese Name–Hung Jen. See also: Samuel Bowen. 1377

Flour, soy. *See* Soy Flour

Fluoridation of Drinking Water with Fluorine. 1248

Fodder, soybean. *See* Feeds / Forage from Soybean Plants or Full-Fat Seeds

Food Production and Distribution Administration of USDA. *See* United States Department of Agriculture (USDA)–War Food Administration (WFA)

Food and Drug Administration (FDA, U.S. Dept. of Health and Human Services). 717, 873, 1230, 1370, 1412, 1476, 1486, 1505, 1584, 1593, 1598, 1615, 1623, 1626, 1663

Food uses of soybeans, breeding for. *See* Variety Development, Breeding, Selection, Evaluation, Growing, or Handling of Soybeans for Food Uses

Foodservice and Institutional Feeding or Catering, Including Quantity or Bulk Recipes. 1322, 1340, 1463

Foodservice and institutional feeding or catering. *See* School Lunch Program

Forage, soybean. *See* Feeds / Forage from Soybean Plants, Feeds / Forage from Soybean Plants or Full-Fat Seeds

Ford, Henry (1863-1947), and His Researchers–Work with Soy–Robert Boyer, Frank Calvert, William Atkinson, Edsel Ruddiman, Bob Smith, Holton W. "Rex" Diamond, and Jan Willemse. 358, 373, 397, 402, 407, 408, 418, 426, 673, 1047, 1322

Foreign Agricultural Service of USDA. *See* United States Department of Agriculture (USDA)–Foreign Agricultural Service (FAS)

Foundry cores, binder. *See* Binder for Sand Foundry Cores

Fouts Family of Indiana–Incl. Taylor Fouts (1880-1952), His Brothers Noah Fouts (1864-1938) and Finis Fouts (1866-1943), Their Soyland Farm (1918-1928), and Their Father Solomon Fouts (1826-1907). 192

France. *See* Europe, Western–France

Frankfurters, hot dogs, or wieners–meatless. *See* Meat Alternatives–Meatless Sausages

Franklin, Benjamin (1706-1790; American Statesman and Philosopher), Charles Thomson, and the American Philosophical Society (APS–Philadelphia, Pennsylvania). 787, 1377

French Polynesia. *See* Oceania

Frozen desserts, non-dairy. *See* Soy Ice Cream

Frozen tofu. *See* Tofu, Frozen or Dried-Frozen

Fuji Oil Co., Ltd. (Osaka, Japan), Incl. Fuji Purina Protein Ltd. 698, 1196

Functional Foods, Nutraceuticals / Nutriceuticals, Designer Foods, or Medicinal Foods. 1618

Funk Brothers Seed Co. (Bloomington, Illinois). Founded in 1901 by Eugene D. Funk, Sr. (1867-1944). Started selling soybeans in 1903. Started Crushing Soybeans in 1924. Renamed Funk Seeds International by 1983. 428, 467, 482, 496, 1179

Galactina S.A. (Belp, Switzerland). 1027

Gandhi, Mohandas K. ("Mahatma") (1869-1948). Vegetarian Pioneer Worldwide, and in India and England. 386, 397, 402, 403

Ganmodoki. *See* Tofu, Fried

Gas, intestinal. *See* Flatulence or Intestinal Gas

Gene banks. *See* Germplasm Collections and Resources, and Gene Banks

Genealogy and Family History. See Also: Obituaries, Biographies. 60, 123, 153, 168, 321, 328, 673, 907, 1023, 1052, 1200, 1272, 1377, 1385, 1387, 1388, 1446, 1698

General Mills, Inc. (Minneapolis, Minneapolis). 642, 698, 1047

Genetic Engineering, Biotechnology (Biotech), and Transgenic Plants. 1173, 1505, 1507, 1508, 1509, 1511, 1522, 1565, 1566, 1578, 1583, 1596, 1605, 1626, 1648, 1662, 1678, 1700, 1708, 1712

Genetically Engineered Foods–Consumer Concern / Response and Labeling. Includes Non-Soy Foods. 1661

Genetics, soybean. *See* Breeding of Soybeans and Classical Genetics

GeniSoy Products Co. (Fairfield, California). Including MLO and Mus-L-On. 1623

Germany. *See* Europe, Western–Germany

Germination / viability of seeds. *See* Seed Germination or Viability–Not Including Soy Sprouts

Germplasm Collections and Resources, and Gene Banks. 655, 657, 738, 740, 787, 839, 985, 987, 1080, 1081, 1136, 1179, 1193, 1195, 1200, 1280, 1492, 1505, 1538, 1709

Glidden Co. (The) (Chicago, Illinois, and Cleveland, Ohio). See also: Julian, Percy. 515

Gluten. *See* Wheat Gluten

Glycemic Index. *See* Carbohydrates–Glycemic Index and Glycemic Load

Glycerine, explosives made from. *See* Explosives Made from Glycerine

Glycine javanica or Glycine wightii. *See* Neonotonia wightii

Glycine soja. *See* Wild Annual Soybean

Glycine species, wild perennial. *See* Wild, Perennial Relatives of the Soybean

Goitrogens / Goitrogenic Substances (Which Can Affect Thyroid Function and Cause Goiter). 1336, 1338, 1447, 1469, 1471, 1546, 1585, 1613, 1663

Golbitz, Peter. *See* Soyatech (Bar Harbor, Maine)

Government policies and programs effecting soybeans. *See* Policies and programs

Grades and grading of soybeans. *See* Seed Quality of Soybeans–Condition, Grading, and Grades (Moisture, Foreign Material, Damage, etc.)

Graham, Sylvester (1794-1851). American Health Reformer and Vegetarian (New York). 296

Granose Foods Ltd. (Newport Pagnell, Buckinghamshire [Bucks.], England). Founded in 1899 under the name The International Health Association Ltd. Renamed Granose Foods Ltd. in 1926. Acquired by Haldane Foods Group in Jan. 1991. 453, 877, 879, 1045, 1224, 1237, 1275

Granum. *See* Natural Foods Distributors and Master Distributors in the USA–Janus

Grazing green soybean plants. *See* Feeds / Forage from Soybean Plants–Pasture, Grazing or Foraging

Great Eastern Sun and Macrobiotic Wholesale Co. (North Carolina). 1088, 1166, 1294, 1604

Green Manure, Use of Soybeans as, by Plowing / Turning In / Under a Crop of Immature / Green Soybean Plants for Soil Improvement. 152, 256, 258, 311, 321, 380, 387, 473, 496, 497, 538, 1204

Green Vegetable Soybeans–Horticulture–How to Grow as a Garden Vegetable or Commercially. 76, 1545

Green Vegetable Soybeans–Imports, Exports, International Trade. 1441

Green Vegetable Soybeans–The Word Edamame (Japanese-Style, in the Pods), Usually Grown Using Vegetable-Type Soybeans–Appearance in European-Language Documents. 763, 1279, 1441, 1445, 1456, 1459, 1533, 1545, 1626, 1656, 1693

Green Vegetable Soybeans–Vegetable-Type, Garden-Type, or Edible of Food-Grade Soybeans, General Information About, Including Use As Green Vegetable Soybeans. 406, 428, 496, 1457

Green Vegetable Soybeans Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1279, 1457

Green Vegetable Soybeans Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1279

Green Vegetable Soybeans, Usually Grown Using Vegetable-Type Soybeans. 76, 80, 107, 115, 146, 214, 215, 255, 283, 312, 321, 379, 385, 406, 428, 430, 440, 467, 473, 496, 497, 640, 763, 821, 822, 826, 857, 957, 1080, 1276, 1279, 1441, 1445, 1456, 1457, 1459, 1496, 1533, 1536, 1545, 1560, 1626, 1628, 1630, 1642, 1656, 1693

Green soybeans. *See* Soybean Seeds–Green

Griffith Laboratories (Chicago and Alsip, Illinois). 794

Grilled tofu. *See* Tofu, Grilled. Japanese-Style

Groundnuts. *See* Peanut, Peanuts

Growth regulators / substances -. *See* Soybean–Growth Regulators / Substances

Guam. *See* Oceania–Guam

Gunther Products, Inc. (Galesburg, Illinois. Founded by J.K. Gunter in 1949. Started in 1950. Acquired in April 1995 by Quest International, a Unit of Unilever). 1050

HVP type soy sauce. *See* Soy Sauce, HVP Type (Non-Fermented or Semi-Fermented)

HVP. *See* Hydrolyzed Vegetable Protein (Non-Soy), or Soy Protein–Hydrolyzed (General)

Haberlandt soybean variety. *See* Soybean Varieties USA–Haberlandt

Haberlandt, Friedrich J. (1826-1878, *Hochschule fuer Bodenculture*, Vienna, Austria). 321, 496, 1702

Hackleman, Jay C. (1888-1970, Extension Agronomist, Univ. of Illinois). 405

Hain Celestial Group, Inc. (Uniondale, New York). Hain Food Group, Inc. before 30 May 2000. Hain Pure Food Co. since Nov. 1931. Founded in Oct. 1926 by Harold Hain as Hain Health Foods. 1048, 1626, 1658, 1713

Haldane Foods Group Ltd. (Newport Pagnell, Buckinghamshire, England). Including Regular Tofu Co., Realeat Foods, Direct Foods, Haldane Foods, Vegetarian Feasts, Vegetarian Cuisine, Genice, Unisoy, and Granose Foods Ltd. Acquired by The Hain Celestial Group in fall 2006. 877, 879, 1027, 1045, 1213, 1219, 1224, 1237, 1275, 1278, 1327, 1430

Hamanatto. *See* Soy Nuggets

Harvesting and Threshing Soybeans (Including Use of Chemical Defoliation and Defoliants to Facilitate Harvesting). 246, 251, 256, 258, 307, 321, 331, 394, 418, 467, 473, 496, 539, 542, 653, 672, 673, 748, 1063, 1190

Hauser, Gayelord (1895-1984). Health foods pioneer, author, and lecturer in Los Angeles, California. 1649

Hawaii. *See* United States–States–Hawaii

Hay, soybean. *See* Feeds / Forage from Soybean Plants–Hay

Healing arts, alternative. *See* Medicine–Alternative

Health Foods–Manufacturers. 391, 400, 453, 759, 794, 879, 1007, 1224, 1237, 1259, 1387, 1388, 1537, 1607

Health Foods Movement and Industry in United Kingdom. 453, 879, 1119, 1237, 1275

Health Foods Movement and Industry in the United States–General (Started in the 1890s by Seventh-day Adventists). 586, 671, 1528, 1589

Health Foods Stores / Shops (mostly USA)–Early (1877 to 1970s). 356, 375, 381, 391, 393, 440, 617, 1385, 1386, 1387, 1388, 1649

Health and Dietary / Food Reform Movements, especially from 1830 to the 1930s. 342, 879, 893, 894

Health claims. *See* Claim or Claims of Health Benefits–Usually Authorized by the FDA

Health food companies in England. *See* Pitman Health Food Company

Health foods distributors and wholesalers. *See* Landstrom Co. (California)

Health foods manufacturers. *See* Baker, Bill, Cubbison, Sophie, El Molino Mills

Health foods movement in Los Angeles, California. *See* Baker, Bill, Cubbison, Sophie, El Molino Mills, Hauser, Gayelord, Irvine, Clarke

Health foods movement in Midwest and East Coast. *See* Kellogg, John Harvey as a Health Food Pioneer

Heart disease and diet. *See* Cardiovascular Disease, Especially Heart Disease and Stroke

Hemagglutinins (Lectins or Soyin) (Proteins Which Agglutinate Red Blood Cells). 1200, 1336, 1338, 1370

Hemp Oil or Hempseed Oil (from the seeds of *Cannabis sativa).* 122, 132, 313

Hemp *(Cannabis sativa)*–Used as a Source of Fiber for Textiles or Paper, Protein (Edestin), or Seeds *(Asanomi).* Includes Marijuana / Marihuana. See Also Hemp Oil or Hempseed Oil. Does NOT include Wild Hemp *(Sesbania macrocarpa)* or Sunn Hemp *(Crotolaria juncea)* or Manila hemp *(Musa textilis,* a species of plantain). 122, 132, 313, 1047

Henselwerk GmbH (Magstadt near Stuttgart, Germany). 995, 1231, 1241

Herbicides. *See* Weeds–Control and Herbicide Use

Heuschen-Schrouff B.V. (Landgraaf, Netherlands), Including Its Subsidiary SoFine Foods (The Latter Acquired by Vandemoortele Group on 23 June 2006). 1027, 1231, 1236, 1658

Hexane. *See* Solvents

Higashimaru. *See* Soy Sauce Companies (Asia)

Higeta. *See* Soy Sauce Companies (Asia)

Hinoichi / Hinode, House Foods & Yamauchi Inc. *See* House Foods America Corporation (Los Angeles, California)

Historical–Documents (Published After 1923) About Soybeans or Soyfoods Before 1900. 310

Historical–Documents on Soybeans or Soyfoods Published Before 1900. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145

Historical–Documents on Soybeans or Soyfoods Published from 1900 to 1923. 146, 147, 148, 149, 150, 151, 152, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328

Historical–Earliest Commercial Product Seen of a Particular Type or Made in a Particular Geographic Area. 381, 527, 557, 849, 1258

Historical–Earliest Document Seen Containing a Particular Word, Term, or Phrase. 2, 3, 29, 38, 64, 95, 107, 122, 132, 243, 253, 304, 321, 325, 384, 418, 419, 475, 642, 735, 1336

Historical–Earliest Document Seen That Mentions a Particular Soybean Variety. 296, 482

Historical–Earliest Document Seen of a Particular Type. 407

Historical–Earliest Document Seen on a Particular Geographical Area–a Nation / Country, U.S. State, Canadian Province, or Continent. 1, 62, 66, 70, 81, 89, 94, 95, 103, 153, 155, 167, 172, 235, 273, 307, 318, 319, 340, 379, 380, 385, 387, 422, 431, 438, 487, 497, 506, 524, 553, 559, 591, 639, 688, 690, 691, 713, 737, 747, 802, 803, 831, 855, 1008

Historical–Earliest Document Seen on a Particular Subject. 115, 313, 349, 375, 377, 407, 511, 557, 617, 719, 898, 938, 1048, 1188, 1630

Historical–Earliest Document Seen on a Particular Subject. 8, 39, 53, 60, 64, 65, 74, 100, 230, 261, 304, 334, 355, 430, 470, 555, 1313

Historically Important Events, Trends, or Publications. 1048, 1143, 1202, 1210, 1275, 1278, 1309, 1437, 1626, 1627

History of the Soybean–Myths and Early Errors Concerning Its History. 307

History. See also Historical–Earliest..., Biography, and Obituaries. 122, 132, 192, 217, 218, 235, 243, 296, 307, 310, 321, 326, 328, 342, 347, 350, 373, 375, 383, 385, 386, 387, 402, 403, 406, 426, 428, 430, 455, 467, 471, 488, 496, 497, 521, 522, 533, 534, 541, 542, 553, 578, 582, 589, 597, 603, 635, 642, 649, 673, 683, 719, 726, 730, 731, 732, 738, 758, 759, 774, 787, 792, 796, 799, 815, 816, 826, 839, 862, 879, 880, 888, 892, 893, 894, 897, 899, 907, 942, 948, 955, 981, 989, 1007, 1014, 1016, 1020, 1027, 1047, 1048, 1050, 1051, 1052, 1055, 1061, 1082, 1084, 1088, 1109, 1121, 1133, 1179, 1190, 1191, 1196, 1199, 1200, 1207, 1210, 1213, 1214, 1229, 1230, 1237, 1238, 1239, 1241, 1242, 1248, 1256, 1259, 1272, 1277, 1278, 1281, 1286, 1294, 1297, 1309, 1322, 1327, 1340, 1346, 1349, 1371, 1377, 1380, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1404, 1409, 1437, 1446, 1451, 1453, 1505, 1507, 1508, 1514, 1541, 1555, 1557, 1587, 1588, 1591, 1597, 1604, 1614, 1617, 1626, 1628, 1668, 1670, 1673, 1676, 1680, 1681, 1684, 1687, 1689, 1690, 1699, 1701, 1702, 1711, 1713

Hogging down soybeans. *See* Forage from Soybean Plants–Hogging Down

Holland. *See* Europe, Western–Netherlands

Holmberg, Sven A. (1894-1982, Fiskeby, Norrköping, Sweden). Soybean Breeder for the Far North. 738, 1002

Homemade tofu. *See* Tofu, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand

Honeybees. *See* Bees

Honeymead (Mankato, Minnesota)–Cooperative. 677

Honeymead Products Co. (Cedar Rapids, Spencer, and Washington, Iowa, 1938-1945. Then Mankato, Minnesota, 1948-1960). See also Andreas Family. 677, 942

Hong Kong. *See* Asia, East–Hong Kong

Hormones from soybeans. *See* Sterols or Steroid Hormones

Horse bean. *See* Broad Bean *(Vicia faba)*

Horses, Mules, Donkeys or Asses Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed. 116

Horvath, Artemy / Arthemy Alexis (1886-1979). 347

House Foods America Corporation (Los Angeles, California). Formerly Hinoichi / Hinode, House Foods & Yamauchi Inc. 800

Huegli Naehrmittel A.G. (Steinach-Arbon, Switzerland), Yamato Tofuhaus Sojaprodukte GmbH (Tuebingen-Hirschau, Germany), Horst Heirler (Gauting bei Muenchen, Germany), Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH (Dorsten, Germany), and KMK (Kurhessische Molkerei Kassel). 1027, 1231, 1236, 1241

Hulls, soybean, uses. *See* Fiber, Soy

Human Nutrition–Clinical Trials. 321, 609, 678, 735, 818, 852, 868, 1311, 1532, 1586, 1606, 1612, 1616, 1629, 1653

Hunger, Malnutrition, Famine, Food Shortages, and Mortality Worldwide. 506, 525, 559, 583, 652, 700, 715, 718, 826, 1001, 1195

Hyacinth Bean. *Lablab purpureus* (L.) Sweet; formerly *Dolichos lablab*. Also Called Bonavist Bean, Egyptian Kidney Bean, Egyptian Lentil. In South and Southeast Asia Called Lablab Bean. Chinese–Biandou (W.-G. Pien Tou). 104, 167, 307, 336, 341, 503, 705, 826

Hydraulic presses. *See* Soybean Crushing–Equipment–Hydraulic Presses

Hydrogenated Products (Margarine, Shortening, Soy Oil) Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 418, 521, 522, 857

Hydrogenation–Safety and Digestibility Issues. 1292, 1300

Hydrogenation of Soybean Oil, Soy Fatty Acids, or Soy Lecithin. 350, 857, 942

Hydrogenation. *See* Margarine, Shortening, Trans Fatty Acids, Vanaspati, also Margarine and Shortening

Hydrolyzed Vegetable Protein (HVP)–Not Made from Soybeans. See also: Soy Proteins–Hydrolyzed and Hydrolysates (General). 698

Hydrolyzed soy protein. *See* Soy Protein–Hydrolyzed and Hydrolysates (General)

Hymowitz, Theodore (Soybean Historian and Prof. of Plant Breeding, Univ. of Illinois). 622

Ice cream, non-soy, non-dairy. *See* Soy Ice Cream–Non-Soy Non-Dairy Relatives

Ice cream, soy. *See* Soy Ice Cream

Ice creams (non-dairy). *See* Rice Milk Products–Ice Creams (Non-Dairy)

Identity Preserved / Preservation. 1560, 1578, 1626, 1657, 1700, 1708, 1712

IITA(Nigeria). *See* International Institute of Tropical Agriculture (IITA) (Ibadan, Nigeria)

Illinois, University of (Urbana-Champaign, Illinois). Soyfoods Research & Development. 1339, 1499

Illinois. *See* United States–States–Illinois

Illumination or Lighting by Burning Soy Oil in Wicked Oil Lamps Like Kerosene–Industrial Uses of Soy Oil as a Non-Drying Oil. 235, 264, 347

Illustrations (Often Line Drawings) Published before 1924. See also Photographs. 95, 107, 119, 122, 132, 133, 152, 153, 163, 224, 279

Illustrations Published after 1923. See also Photographs. 342, 347, 381, 400, 403, 407, 409, 423, 433, 435, 436, 450, 515, 530, 553, 603, 672, 673, 710, 786, 826, 924, 950, 954, 978, 994, 1038, 1103, 1137, 1198, 1213, 1221, 1222, 1226, 1308, 1326, 1329, 1523, 1604, 1683

Imagine Foods, Inc. (Palo Alto & San Carlos, California). Rice Dream / Beverage Manufactured by California Natural Products (CNP, Manteca, California). 1048, 1588, 1598

Implements, agricultural. *See* Machinery (Agricultural), Implements, Equipment and Mechanization

Important Documents #1–The Very Most Important. 1, 2, 3, 19, 21, 55, 60, 62, 64, 66, 70, 71, 81, 89, 94, 95, 107, 153, 155, 167, 172, 235, 256, 258, 273, 296, 307, 310, 313, 318, 319, 321, 340, 348, 349, 350, 375, 377, 379, 380, 385, 387, 407, 419, 422, 427, 430, 431, 438, 471, 482, 487, 496, 497, 506, 511, 524, 553, 555, 557, 559, 591, 617, 639, 688, 690, 691, 713, 719, 737, 738, 747, 802, 803, 826, 831, 855, 857, 898, 938, 986, 1008, 1020, 1048, 1055, 1080, 1081, 1114, 1168, 1179, 1188, 1190, 1243, 1291, 1540, 1630, 1689, 1701, 1702

Important Documents #2–The Next Most Important. 8, 29, 53, 65, 76, 122, 132, 246, 304, 325, 334, 337, 355, 384, 386, 402, 403, 405, 418, 444, 470, 475, 538, 542, 592, 634, 642, 672, 673, 698, 735, 758, 787, 816, 839, 891, 987, 989, 1027, 1126, 1147, 1200, 1231, 1232, 1319, 1336, 1338, 1341, 1342, 1546, 1547, 1548, 1577

Imports. *See* Trade of Soybeans, Oil & Meal, or see Individual Soyfoods Imported

India. *See* Asia, South–India

Indiana Soy Pioneers. *See* Central Soya Co., Fouts Family, Meharry

Indiana. *See* United States–States–Indiana

Indonesia. *See* Asia, Southeast–Indonesia

Indonesian restaurants outside Indonesia, or Indonesian recipes that use soy ingredients outside Indonesia. *See* Asia, Southeast–Indonesia–Indonesian Restaurants Outside Indonesia and Soy Ingredients Used in Indonesian-Style Recipes Restaurants Outside Japan

Indonesian-style fermented soybean paste. *See* Tauco–Indonesian-Style Fermented Soybean Paste

Indonesian-style miso, etymology of. *See* Miso, Indonesian-Style

Indonesian-style soy sauce. *See* Soy Sauce, Indonesian Style or from the Dutch East Indies (Kecap, Kécap, Kechap, Ketjap, Kétjap) Ketchup / Catsup

Indonesians Overseas, Especially Work with Soya. 888, 1020, 1055

Industrial Uses of Soy Oil–Etymology of Related Terms and Their Cognates / Relatives in Various Languages. 1025, 1038

Industrial Uses of Soy Proteins–Etymology of This Term and Its Cognates / Relatives in Various Languages. 438

Industrial Uses of Soy Proteins–General and Minor Uses–Galalith, Sojalith, Cosmetics (Lotions and Soaps), Rubber Substitutes, Insecticides, etc. 438, 592, 1180

Industrial Uses of Soybeans (General Non-Food, Non-Feed). 857

Industrial Uses of Soybeans (Non-Food, Non-Feed)–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 438, 455, 599, 857

Industrial uses of soy oil as a drying oil. *See* Adhesives, Asphalt Preservation Agents, Caulking Compounds, Artificial Leather, and Other Minor or General Uses, Ink for Printing, Paints, Varnishes, Enamels, Lacquers, and Other Protective / Decorative Coatings, Rubber Substitutes or Artificial / Synthetic Rubber (Factice)

Industrial uses of soy oil as a non-drying oil. *See* Lubricants, Lubricating Agents, and Axle Grease for Carts

Industrial uses of soy proteins (including soy flour). *See* Adhesives or Glues for Plywood, Other Woods, Wallpaper, or

Building Materials

Industrial uses of soy proteins. *See* Fibers (Artificial Wool or Textiles Made from Spun Soy Protein Fibers, Including Azlon, Soylon, and Soy Silk / Soysilk), Paints (Especially Water-Based Latex Paints), Paper Coatings or Sizings, or Textile Sizing, Plastics (Including Molded Plastic Parts, Plastic Film, Disposable Eating Utensils and Tableware–From Spoons to Plates, and Packaging Materials)

Industrial uses of soybeans. *See* Chemurgy, the Farm Chemurgic Movement, and the Farm Chemurgic Council (USA, 1930s to 1950s) Including, Lecithin, Soy–Industrial Uses, Soybean Meal / Cake, Fiber (as from Okara), or Shoyu Presscake as a Fertilizer or Manure for the Soil

Industry and Market Analyses and Statistics–Market Studies. 313, 325, 1048, 1618, 1679

Infant Foods and Infant Feeding, Soy-based. See Also Infant Formulas, Soy-based. 347, 377, 424, 700, 763, 863, 880, 1037, 1234, 1235, 1383, 1411, 1448, 1493, 1503, 1544

Infant Formula / Formulas, Soy-based, Including Effects on Infant Health (Alternatives to Milk. Usually Fortified and Regulated. Since 1963 Usually Made from Soy Protein Isolates). 609, 678, 735, 798, 1135, 1155, 1203, 1230, 1342, 1351, 1352, 1353, 1354, 1356, 1357, 1358, 1359, 1360, 1364, 1365, 1370, 1373, 1384, 1391, 1395, 1396, 1401, 1402, 1403, 1405, 1412, 1416, 1418, 1420, 1421, 1426, 1427, 1428, 1435, 1461, 1462, 1466, 1467, 1468, 1470, 1472, 1474, 1475, 1476, 1480, 1483, 1501, 1508, 1521, 1531, 1542, 1553, 1562, 1567, 1570, 1571, 1574, 1576, 1577, 1585, 1601, 1603, 1613, 1713

Infant Formula Industry and Market Statistics, Trends, and Analyses. 1203, 1230, 1593

Infinity Food Co. Renamed Infinity Company by 1973 (New York City, New York). 662

Information, computerized. *See* Computerized Databases and Information Services, and Websites, Websites or Information on the World Wide Web or Internet

Information. *See* Computers (General) and Computer Hardware Related to Soybean Production and Marketing. See also: Computer Software

Ink for Printing–Industrial Uses of Soy Oil as a Drying Oil. 407

Innoval / Sojalpe (Affiliate of Les Silos de Valence–Valence, France). 1238

Inoculum / inocula of nitrogen fixing bacteria for soybeans. *See* Nitrogen Fixing Cultures

Insects–Pest Control. See also: Integrated Pest Management. 95, 163, 243, 256, 258, 296, 321, 385, 386, 402, 403, 428, 473, 496, 562, 596, 653, 669, 740, 744, 745, 746, 747, 748, 752, 755, 758, 814, 839, 868, 871, 872, 891, 896, 903, 917, 999, 1070, 1126, 1190, 1471, 1646

Institut de Recherches Agronomiques Tropicales (IRAT–Tropical Institute of Agronomic Research). 639, 737, 802, 903, 917, 1063, 1190, 1195

Institutional feeding. *See* Foodservice and Institutional Feeding or Catering

Integrated Pest Management (IPM) and Biological Control. 744, 1312

Interchem Industries (Kansas). *See* Diesel Fuel, SoyDiesel, Biodiesel–Interchem

Intercropping–use of soybeans in. *See* Cropping Systems: Intercropping, Interplanting, or Mixed Cropping

International Institute of Agriculture (IIA) (Rome). 304, 313, 325, 326, 379, 380, 385, 402

International Institute of Tropical Agriculture (IITA) (Ibadan, Nigeria). 738, 987, 1080, 1126, 1151, 1190, 1195, 1709

International Nutrition Laboratory. *See* Miller, Harry W. (M.D.) (1879-1977)

International soybean programs. *See* Asian Vegetable R&D Center (AVRDC, Taiwan), INTSOY–International Soybean Program (Univ. of Illinois, Urbana, Illinois), International Institute of Agriculture (IIA) (Rome), International Institute of Tropical Agriculture (IITA) (Ibadan, Nigeria), United Nations (Including UNICEF, FAO, UNDP, UNESCO, and UNRRA) Work with Soy, *Institut de Recherches Agronomiques Tropicales* (IRAT–Tropical Institute of Agronomic

Internet. *See* Websites or Information on the World Wide Web

Intestinal Flora / Bacteria and Toxemia–Incl. Changing and Reforming (*L. Acidophilus, Bifidus, L. Bulgaricus* etc.). 440, 1618

Introduction of Soybeans (as to a Nation, State, or Region, with P.I. Numbers for the USA) and Selection. 71, 79, 81, 86, 89, 95, 110, 115, 172, 190, 213, 214, 216, 219, 220, 221, 228, 234, 238, 240, 241, 243, 246, 247, 251, 252, 257, 265, 266, 270, 272, 273, 281, 285, 289, 295, 303, 319, 321, 333, 340, 379, 380, 385, 387, 438, 448, 467, 488, 494, 497, 499, 591, 622, 639, 655, 661, 781, 802, 803, 814, 831, 838, 855, 871, 872, 873, 927, 933, 934, 957, 976, 986, 998, 1002, 1008, 1179, 1387

Introduction of foreign plants to the USA. *See* United States Department of Agriculture (USDA)–Section of Foreign Seed and Plant Introduction

INTSOY–International Soybean Program (Univ. of Illinois, Urbana, Illinois). Founded July 1973. 691, 737, 741, 747, 769, 802, 803, 814, 831, 838, 870, 900, 928, 933, 934, 957, 970, 976, 986, 1008, 1029, 1081, 1110, 1151, 1179, 1190, 1195, 1200

Iodine number. *See* Soy Oil Constants–Iodine Number

Iowa. *See* United States–States–Iowa

IRAT. *See Institut de Recherches Agronomiques Tropicales* (IRAT)

Irradiation of Soybeans for Breeding and Variety Development (Usually Gamma Irradiation to Cause Mutations). 1276

Irvine, Clarke (1893-1975). Founder, Editor, and Publisher of *California Health News* (1933-1937, newspaper), *Health News* (1937-1942, newspaper), and *Let's Live* (1942 to Present, magazine). 388, 1649

Island Spring, Inc. (Vashon, Washington). 1020, 1048, 1055, 1213

Isoflavone or Phytoestrogen Content of Soyfoods, Soy-based Products, Soy Ingredients, and Soybean Varieties (Esp. Genistein, Daidzein, and Glycitein). 1414, 1488, 1544

Isoflavones (Soy) Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1540, 1584

Isoflavones in soybeans and soyfoods. *See* Estrogens, Incl. Genistein, Daidzein, etc.

Isoflavones. *See* Estrogens (in Plants–Phytoestrogens, Especially in Soybeans and Soyfoods), Including Isoflavones (Including Genistein, Daidzein, Glyceteín, Coumestrol, Genistin, and Daidzin)

Isolated soy proteins. *See* Soy Proteins–Isolates

Israel. *See* Asia, Middle East–Israel and Judaism

Ito San soybean variety. *See* Soybean Varieties USA–Ito San

Itona (Wigan, Lancashire, England). Maker of Soymilk, Soymilk Products, Soynuts, and Meat Alternatives. 719

Ivory Coast. *See* Africa–Côte d'Ivoire

Jack Bean. *Canavalia ensiformis* (L.) D.C. Also Called Sword Bean (Erroneously; it is *Canavalia gladiata)* and Horse Bean (Rarely). Chinese–Daodou (pinyin); formerly Tao-tou (Wade-Giles). 318, 337, 487, 826

Jackson, James Caleb (1811-1881). American Health Reformer and Vegetarian (New York). 1051

Janus Natural Foods (Seattle, Washington). And Granum. 683, 1088, 1272, 1294

Japan–Shokuhin Sogo Kenkyujo. *See* National Food Research Institute (NFRI) (Tsukuba, Ibaraki-ken, Japan)

Japan–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1151

Japan. *See* Asia, East–Japan

Japanese Overseas, Especially Work with Soya. 217, 328, 683, 1014, 1027, 1051, 1088, 1170, 1201, 1294, 1297, 1348, 1371, 1604

Japanese Soybean Types and Varieties–Early, with Names. 321, 428, 1179

Japanese restaurants outside Japan, or Japanese recipes that use soy ingredients outside Japan. *See* Asia, East–Japan–Japanese Restaurants or Grocery Stores Outside Japan

Jerky, tofu. *See* Tofu, Flavored / Seasoned and Baked, Broiled, Grilled, Braised or Roasted

Jiang–Chinese-Style Fermented Soybean Paste (Soybean Jiang {doujiang} or Chiang / Tou Chiang [Wade-Giles]). Includes *Tuong* from Indochina, Tao-Tjiung and Tao-Tjiong from Indonesia. 235, 307, 312, 347, 385, 1014

Job's Tears *(Coix lachryma-jobi;* formerly *Coix lacryma).* Called *Hatomugi* or *Hato Mugi* in Japanese, and Adlay in South Asia. Sometimes mistakenly called "Pearl Barley" (Since it is unrelated to Barley). 64, 1166

Johannes, Kenlon. *See* Diesel Fuel, SoyDiesel, Biodiesel

Johnson Family of Stryker, Williams County, Ohio. Including (1) Edward Franklin "E.F. Soybean" Johnson (1889-1961) of Johnson Seed Farms (Stryker, Ohio), Delphos Grain and Soya Processing Co. (Ohio), and Ralston Purina Company (Missouri); (2) Elmer Solomon Johnson (1879-1920); (3) Perhaps E.C. Johnson and Hon. Solomon Johnson (1850-1918). 192

Jonathan P.V.B.A. (Kapellen, Belgium). 1027

Juicer, Electric or Manual (Kitchen Appliance / Utensil)–Early Records Only. 892, 1031

Kaempfer, Engelbert (1651-1716)–German physician and traveler. 321, 328

Kanjang–Korean-Style Fermented Soy Sauce. Also spelled Kan Jang. 763, 938, 1014

Kecap, Kechap, Ketjap, Ketchup. *See* Soy Sauce, Indonesian Style or from the Dutch East Indies (Kecap, Kécap, Kechap, Ketjap, Kétjap)

Kellogg Co. (breakfast cereals; Battle Creek, Michigan). *See* Kellogg, Will Keith,... Kellogg Company

Kellogg, John Harvey (M.D.) as a Health Food Pioneer. 453

Kellogg, John Harvey (M.D.), Sanitas Nut Food Co. and Battle Creek Food Co. (Battle Creek, Michigan). Battle Creek Foods Was Acquired by Worthington Foods in 1960. 382, 395, 397, 453, 589, 759, 1047, 1224, 1259, 1390

Kellogg, Will Keith, Kellogg's Toasted Corn Flake Co. Later Kellogg Company (of breakfast cereal fame; Battle Creek, Michigan). 879, 1047

Ketchup–Western-Style, Such as Tomato-, Mushroom-, Walnut-, or Oyster Ketchup, etc. 13, 21, 46, 63, 230, 416, 1711

Ketchup / Catsup–Imports, Exports, International Trade. 5, 9

Ketchup, Catchup, Catsup, Katchup, etc. Word Mentioned in Document. 4, 5, 6, 8, 9, 10, 22, 48, 102, 177, 230, 385, 632, 763, 788, 822, 826, 1642, 1680, 1711

Kibun. *See* Soymilk Companies (Asia)

Kidney / Renal Function. 1114

Kikkoman Corporation (Tokyo, Walworth, Wisconsin; and Worldwide). Incl. Noda Shoyu Co. and Kikkoman International Inc., and Kikkoman Shoyu Co. 217, 323, 348, 938, 1014, 1170, 1201, 1514, 1555, 1597, 1617

Kinako. *See* Roasted Whole Soy Flour (Kinako–Dark Roasted, Full-Fat)

Kiribati. *See* Oceania

Kloss, Jethro. *See* Seventh-day Adventists–Cookbooks and Their Authors

Koji (Cereal Grains {Especially Rice or Barley} and / or Soybeans Fermented with a Mold, Especially *Aspergillus oryzae*). 76, 235, 307, 348, 406, 938, 1175, 1272, 1604

Korea–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 1151

Korea. *See* Asia, East–Korea

Korean-style fermented soy sauce. *See* Kanjang–Korean-Style Fermented Soy Sauce

Koreans Overseas, Especially Work with Soya. 178, 892, 1658

Kosher / Kashrus, Pareve / Parve / Parevine–Regulations or Laws. See also: Kosher Products (Commercial). 1134, 1149, 1172, 1482

Kosher Products (Commercial). 1464

Kraft Foods Inc. (Work with Soy). Including Anderson Clayton, Boca Burger, and Balance Bar. 518, 1048, 1140, 1242, 1626

Kudzu or Kuzu–Tropical Kudzu or Puero *(Pueraria phaseoloides)* (Roxb.) Benth. Formerly *Pueraria javanica*. 507

Kudzu or Kuzu *(Pueraria montana* var. *lobata*. Formerly *Pueraria lobata, Pueraria thunbergiana, Pachyrhizus thunbergianus, Dolichos lobatus)*. For Rhodesian Kudzu Vine see *Neonotonia wightii.* See also Tropical Kudzu or Puero *(Pueraria phaseoloides)*. 60, 64, 74, 94, 103, 311, 318, 487, 507, 789, 796, 1220, 1243, 1381

Kushi, Michio and Aveline–Their Life and Work with Macrobiotics, and Organizations They Founded or Inspired. 1088, 1294, 1297, 1371, 1604, 1670

Kuzu. *See* Kudzu or Kuzu *(Pueraria...)*

La Choy Food Products, Inc. Purchased in Sept. 1943 by Beatrice Creamery Co. 1179

La Sierra Industries (La Sierra, California). *See* Van Gundy, Theodore A., and La Sierra Industries

Lablab purpureus or Lablab bean. *See* Hyacinth Bean

Lactose Intolerance or Lactase Deficiency. 1359, 1574

Lager, Mildred (Los Angeles, California). 597

Land O'Lakes, Inc. 942, 1302

Landstrom Co. (San Francisco, California). Wholesale Distributor of Health Foods and Natural Foods. Founded in 1931 by Wesley Landstrom. 603

Latin America (General). 253, 529, 549, 597, 698, 718, 763, 805, 848, 857, 894, 928, 989, 1014, 1020, 1055, 1679

Latin America–Caribbean–Antigua and Barbuda (Including Redonda). 385, 387, 729, 1110

Latin America–Caribbean–Bahamas, Commonwealth of The (Also Called The Bahamas, Bahama Islands, or Bahama). 387, 559, 802, 803

Latin America–Caribbean–Barbados. 385

Latin America–Caribbean–Bermuda (A British Dependent Territory). 385, 387

Latin America–Caribbean–British Dependent Territories–Anguilla, Cayman Islands, British Virgin Islands, Montserrat, Turks and Caicos Islands. See also: Bermuda. 385, 387, 559

Latin America–Caribbean–Cuba. 172, 313, 321, 324, 385, 422, 427, 428, 515, 559, 986, 1247, 1312, 1444

Latin America–Caribbean–Dominica. 387, 559, 713, 729

Latin America–Caribbean–Dominican Republic (Santo Domingo or San Domingo before 1844). 385, 559, 713, 729, 760, 763, 803, 822, 900, 1029, 1110

Latin America–Caribbean–French Overseas Departments–Guadeloupe, and Martinique (French West Indies). Guadeloupe (consisting of two large islands–Basse-Terre and Grande-Terre) administers 5 smaller dependencies–Marie-Galante, Les Saintes, La Désirade, St.-Barthélemy, and St. Martin (shared with Netherlands Antilles). 385, 444, 559, 802, 1092, 1190

Latin America–Caribbean–Grenada. 387, 559, 713

Latin America–Caribbean–Haiti. 559, 713, 729, 760, 763, 822

Latin America–Caribbean–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning the Caribbean. 324, 1247

Latin America–Caribbean–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain Caribbean country. 387

Latin America–Caribbean–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain Caribbean country. 387

Latin America–Caribbean–Jamaica. 385, 507, 538, 559, 713, 729, 760, 763, 802, 803, 822, 938, 1110

Latin America–Caribbean–Lesser Antilles–Virgin Islands (Including British Virgin Islands and Virgin Islands of the United States–St. Croix, St. John, and St. Thomas), Leeward Islands (Anguilla, Antigua and Barbuda [Including Redonda], Dominica, Guadeloupe, Montserrat, Saint Kitts [formerly Saint Christopher] and Nevis), Windward Islands (Barbados, Grenada, Martinique, St. Lucia, St. Vincent and the Grenadines, Trinidad and Tobago), and Netherlands Dependencies (Including Aruba, Curaçao or Curacao, and Bonaire off Venezuela, and Saba, St. Eustatius, and southern St. Martin / Maarten in the Lesser Antilles). Note–Guadeloupe and Martinique and the five dependencies of Guadeloupe, which are French Overseas Departments in the Lesser Antilles, are also called the French West Indies, French Antilles, or Antilles françaises. 313, 325, 385, 387, 444, 559, 713, 729, 763, 802, 803, 822, 938, 939, 1092, 1093, 1110, 1172, 1190, 1275, 1312

Latin America–Caribbean–Netherlands Dependencies–Netherlands Antilles, and Aruba–Curaçao (Curacao), Bonaire, Saba, St. Eustatius, and St. Maarten (Shared with France as St.-Martin). Aruba was part of Netherlands Antilles until 1986. 325

Latin America–Caribbean–Puerto Rico, Commonwealth of (A Self-Governing Part of the USA; Named Porto Rico until 1932). 172, 385, 538, 559, 662, 691, 743, 803, 804, 807, 843, 986, 1008, 1029, 1312, 1666

Latin America–Caribbean–Saint Kitts and Nevis, Federation of. 387, 729

Latin America–Caribbean–Saint Lucia. 387, 559, 713, 729

Latin America–Caribbean–Saint Vincent and the Grenadines. 387, 713, 729, 1110

Latin America–Caribbean–Trinidad and Tobago. 385, 387, 713, 763, 802, 803, 822, 938, 939, 1275

Latin America–Caribbean–Virgin Islands of the United States–St. Thomas, St. John, and St. Croix (Danish West Indies before Jan. 1917). 559, 1093, 1172, 1312

Latin America–Caribbean or West Indies (General). 312, 506, 522, 734, 1023, 1294, 1669

Latin America–Central America (General). Includes Mexico and Mesoamerica. 313, 325, 1594, 1625, 1641

Latin America–Central America–Belize (Named British Honduras from 1840 to about 1975, Belize before 1840). 325, 385, 559, 628, 691, 713, 729, 760, 802, 1008

Latin America–Central America–Canal Zone including the Panama Canal (Opened 1914, Owned and Operated by the USA. Returned to Panama on 31 Dec. 1999). 559

Latin America–Central America–Costa Rica. 172, 385, 559, 683, 691, 713, 729, 760, 763, 802, 822, 900, 938, 989, 1008, 1110, 1195, 1237, 1275, 1294, 1312, 1611

Latin America–Central America–El Salvador. 385, 482, 507, 559, 713, 729, 760, 938, 1110, 1179

Latin America–Central America–Guatemala. 385, 559, 691, 713, 729, 760, 804, 900, 938, 986, 989, 1008, 1023, 1029, 1110, 1195, 1312

Latin America–Central America–Honduras. 559, 713, 729, 760, 763, 802, 822, 831, 900, 938, 1092, 1110, 1534, 1678

Latin America–Central America–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning Central America. 1247

Latin America–Central America–Mexico–Soy Ingredients Used in Mexican-Style Recipes, Food Products, or Dishes Worldwide. 892, 1490

Latin America–Central America–Mexico. 385, 422, 427, 428, 559, 597, 662, 683, 691, 698, 763, 803, 822, 879, 938, 986, 989, 1008, 1023, 1029, 1083, 1092, 1098, 1110, 1147, 1206, 1237, 1242, 1275, 1320, 1322, 1465, 1678, 1686

Latin America–Central America–Nicaragua. 507, 559, 691, 713, 729, 760, 802, 803, 938, 1029, 1677

Latin America–Central America–Panama. 559, 713, 729, 760, 763, 802, 822, 938, 1008, 1247, 1313

Latin America–Central America–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 597, 1313, 1534

Latin America–Central America–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics. See also Trade (International). 597, 1098, 1143, 1594, 1625, 1641

Latin America–South America (General). 94, 103, 253, 313, 325, 331, 350, 589, 1080, 1243, 1465, 1527, 1594, 1625, 1641, 1677

Latin America–South America–Argentina (Argentine Republic). 313, 321, 323, 325, 357, 385, 422, 427, 428, 453, 507, 542, 559, 592, 597, 683, 698, 761, 763, 775, 795, 802, 803, 822, 831, 857, 879, 900, 917, 938, 953, 986, 1002, 1008, 1061, 1081, 1083, 1098, 1110, 1147, 1150, 1167, 1180, 1206, 1237, 1238, 1291, 1314, 1320, 1424, 1507, 1559, 1560, 1596, 1611, 1662, 1669, 1677, 1678, 1709

Latin America–South America–Argentina–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 857, 1180, 1291, 1424, 1560

Latin America–South America–Bolivia. 559, 682, 713, 729, 760, 763, 802, 803, 822, 831, 857, 900, 938, 986, 989, 1008, 1081, 1083, 1092, 1669, 1709

Latin America–South America–Brazil–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 597, 857, 1424, 1560

Latin America–South America–Brazil, Deforestation in Amazon Basin. 1678

Latin America–South America–Brazil, Federative Republic of. 64, 313, 319, 325, 385, 422, 427, 487, 525, 538, 559, 569, 592, 597, 639, 661, 662, 677, 683, 698, 713, 718, 729, 760, 761, 762, 763, 775, 793, 802, 803, 804, 822, 831, 857, 879, 900, 917, 938, 939, 942, 987, 989, 1008, 1061, 1081, 1083, 1092, 1098, 1110, 1126, 1143, 1147, 1150, 1180, 1200, 1237, 1242, 1275, 1291, 1312, 1314, 1320, 1348, 1424, 1444, 1538, 1559, 1560, 1611, 1662, 1666, 1669, 1677, 1678, 1709

Latin America–South America–Chile (Including Easter Island). 211, 385, 422, 559, 698, 713, 729, 760, 763, 802, 803, 822, 831, 900, 986, 989, 1008, 1029, 1275, 1596

Latin America–South America–Colombia. 385, 427, 559, 597, 691, 698, 713, 729, 760, 763, 802, 803, 804, 822, 831, 857, 900, 928, 986, 989, 1008, 1029, 1081, 1083, 1110, 1143, 1596, 1669, 1678, 1709

Latin America–South America–Ecuador (Including the Galapagos Islands. Formerly also called Equator, the English translation of the Spanish "Ecuador"). 319, 385, 559, 639, 691, 698, 713, 729, 760, 763, 802, 803, 822, 831, 857, 900, 938, 986, 989, 1008, 1029, 1110, 1143, 1195, 1709

Latin America–South America–French Guiana (A French Overseas Department, Guyane or Guyane française, formerly occasionally called Cayenne). 167, 313, 325, 802, 831, 900, 917, 986, 1008, 1029, 1110, 1190

Latin America–South America–Guyana (British Guiana before 1966). 313, 321, 325, 385, 387, 682, 713, 729, 760, 763, 802, 822, 938, 989

Latin America–South America–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain South American country. Soybeans as such had not yet been reported by that date in this country. 559

Latin America–South America–Introduction of Soybeans to or Dissemination of Soybeans from. Other or general information and leads concerning South America. 1247

Latin America–South America–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain South American country. 273

Latin America–South America–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain South American country. 273

Latin America–South America–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain South American country. 387

Latin America–South America–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain South American country. 387

Latin America–South America–Paraguay. 507, 559, 597, 698, 713, 729, 763, 803, 822, 831, 857, 900, 938, 986, 989, 1008, 1029, 1061, 1081, 1083, 1110, 1291, 1296, 1559, 1669, 1678, 1709

Latin America–South America–Peru. 323, 385, 559, 660, 691, 698, 713, 729, 760, 763, 802, 803, 822, 831, 857, 900, 986, 989, 1008, 1023, 1092, 1143, 1147, 1195, 1205, 1247, 1527, 1709

Latin America–South America–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. See also Argentina and Brazil. 597, 660, 682, 857, 1313, 1424, 1560

Latin America–South America–Suriname (Also Surinam before 1978; Dutch Guiana before 1975). 64, 273, 385, 470, 475, 559, 597, 804, 831, 938, 1008, 1312

Latin America–South America–Uruguay, Oriental Republic of. 385, 427, 507, 559, 698, 713, 729, 763, 795, 803, 822, 831, 857, 1008, 1029, 1081, 1083, 1147, 1596, 1678, 1709

Latin America–South America–Venezuela. 387, 559, 597, 763, 764, 802, 822, 900, 938, 989, 1081, 1092, 1110, 1143, 1147, 1312, 1709

Latin America, Caribbean–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Caribbean country. 387

Latin America, Caribbean–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Caribbean country. 387

Latin America, Central America–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain Central American country. Soybeans as such have not yet been reported in this country. 559

Latin America, Central America–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain Central American country. Soybeans as such had not yet been reported by that date in this country. 559

Latin America, Central America–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain Central American country. 385

Latin America, Central America–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain Central American country. 172

Latin America, Central America–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain Central American country. 385

Lauchs (I.F.) Co. (Seattle, Washington). 455

Lauhoff Grain Co. *See* Bunge Corp. (White Plains, New York)

Laurelbrook Natural Foods (Bel Air, Maryland). 1088

Lea & Perrins. *See* Worcestershire Sauce

Leaf Proteins and Leaf Protein Concentrate (LPC) As Alternative Protein Sources. 640, 717

Lecithin, Soy–Industrial Uses. 438

Lecithin, Soy. 122, 132, 321, 347, 383, 385, 395, 406, 424, 430, 433, 434, 435, 438, 515, 592, 857, 869, 881, 1098, 1260, 1262, 1464, 1560

Lectins. *See* Hemagglutinins (Lectins or Soyin)

Lens culinaris or L. esculenta. *See* Lentils

Lentils. *Lens culinaris.* Formerly: *Lens esculenta* and *Ervum lens.* 95, 104, 133, 211, 487, 1266, 1670, 1675

Lever Brothers Co. *See* Unilever Corp.

Leviton, Richard. *See* Soyfoods Association of North America (SANA)

Li Yu-ying (Li Yü-ying; Courtesy Name: Li Shizeng (Pinyin), Li Shih-tseng (W.-G.); Chinese Soyfoods Pioneer in France; born 1881 in Peking, died 1973 in Taipei, Taiwan) and Usine de la Caséo-Sojaïne (Les Valées, Colombes (near Asnières), a few miles northwest of Paris, and China). 235, 321, 385, 1027

Libraries. *See* National Agricultural Library (NAL, Beltsville, Maryland)

Lifestream Natural Foods Ltd. (Vancouver then Richmond, British Columbia, Canada). And Nature's Path Foods, Inc. Both founded by Arran and Ratana Stephens. 603, 764, 1712

Lighting by burning soy oil. *See* Illumination or Lighting by Burning Soy Oil in Wicked Oil Lamps Like Kerosene

Lightlife Foods, Inc. (Turners Falls, Massachusetts). The Tempeh Works then Tempehworks before April 1987. Founded by Michael Cohen. 1020, 1055, 1463, 1626

Lima Bean or Limas. *Phaseolus limensis.* Formerly: *Phaseolus lunatus.* Also called Butter Bean. 104, 114, 121, 138, 143, 149, 156, 167, 255, 270, 318, 388, 487, 503, 617, 667, 705, 826, 1388

Lima N.V. / Lima Foods (Sint-Martens-Latem, Belgium; and Mezin, France). Owns Jonathan P.V.B.A. Owned by Euronature of Paris, France, since 1989. Owned by the Hain-Celestial Group since 10 Dec. 2001. 764, 1000, 1088, 1294, 1658

Linolenic Acid–Omega-3 (Alpha-Linolenic Acid) Fatty Acid Content of Soybeans and Soybean Products. 1528

Linoleum, Floor Coverings, Oilcloth, and Waterproof Goods–Industrial Uses of Soy Oil as a Drying Oil. 235, 385, 407, 418

Linseed Oil, Linseed Cake / Meal, or the Flax / Flaxseed Plant (*Linum usitatissimum* L.). 64, 122, 132, 253, 287, 296, 313, 325, 326, 418, 494, 521, 582, 588, 942, 1047, 1223, 1251, 1528, 1564, 1607

Lipid and Fatty Acid Composition of Soybeans (Seeds or Plant), or Soybean Products (Including Soy Oil). 80, 175, 196, 235, 256, 258, 269, 377, 691, 767, 1166, 1252, 1292, 1300, 1559

Lipids–Effects of Dietary Lipids (Especially Soy Oil and Lecithin) on Blood Lipids (Especially Cholesterol). 735, 850

Lipids. *See* Linolenic Acid–Omega-3

Lipolytic enzymes in the soybean. *See* Enzymes in the Soybean–Lipoxygenase and Its Inactivation

Lipoxygenase. *See* Enzymes in the Soybean–Lipoxygenase and Its Inactivation

Lists and Descriptions (Official and / or Extensive) of Early U.S. Soybean Varieties with Their P.I. Numbers and Synonyms. 321, 428, 482, 1179

Loma Linda Foods (Riverside, California). Named La Loma Foods from Feb. 1989 to Jan. 1990. Acquired by Worthington Foods in Jan. 1990. 589, 830, 877, 879, 893, 1203, 1230, 1275, 1593

Loma Linda University (Loma Linda, California). Including Loma Linda Hospital (Formerly named Loma Linda Sanitarium and College of Medical Evangelists). 589

Los Angeles–City and County–Work with Soyfoods, Natural / Health Foods, and / or Vegetarianism. 323, 388, 506, 559, 634, 662, 800, 1058, 1170, 1201, 1377, 1649

Low-cost extrusion cookers. *See* Extruders and Extrusion Cooking

Lubricants, Lubricating Agents, and Axle Grease for Carts–Industrial Uses of Soy Oil as a Non-Drying Oil. 196, 253, 347

Lucerne / lucern. *See* Alfalfa or Lucerne

Lukoskie, Luke. *See* Island Spring, Inc. (Vashon, Washington)

Lupins or Lupin (Also spelled Lupine, Lupines, Lupinseed; *Lupinus albus, L. angustifolius, L. luteus, L. mutabilis).* 60, 64, 74, 156, 255, 343, 507, 777, 778, 826, 909, 1204, 1248, 1250, 1375, 1390, 1529, 1530

Lust, Benedict (1872-1945), Louise Stroebel Lust (1868-1925; his wife) and Louis Lust. Pioneers in Naturopathy in the United States (New York City; "Yungborn," Butler, New Jersey; Tangerine, Florida). 342, 396, 435, 1386

MSG (Monosodium Glutamate, the Sodium Salt of Glutamic Acid). 632, 1201, 1482, 1589

Macao / Macau. *See* Asia, East–Macao / Macau (Portuguese Colony)

Machinery (Agricultural), Implements, Equipment, and Mechanization (Binders, Cultivators, Cutters, Harvesters, Mowers, Pickers, Planters, Reapers, Separators, Thrashers, or Threshers). See also: Combines and Tractors. 246, 473, 478, 1256

Machinery, farm. *See* Combines

Macrobiotics. *See* Aihara, Herman and Cornellia–Their Life and Work, Kushi, Michio and Aveline–Their Life and Work, Muramoto, Noboru–His Life and Work, Ohsawa, George and Lima

Macrobiotics. See also: George Ohsawa, Michio and Aveline Kushi, Herman and Cornellia Aihara. 557, 586, 662, 683, 719, 764, 835, 892, 908, 960, 971, 972, 1000, 1014, 1088, 1166, 1227, 1239, 1241, 1253, 1257, 1272, 1294, 1297, 1299, 1348, 1349, 1371, 1409, 1465, 1575, 1604, 1614, 1658, 1670, 1687, 1707

Maize. *See* Corn / Maize

Malnutrition, hunger, famine, and food shortages. *See* Hunger, Malnutrition, Famine, Food Shortages, and Mortality

Mammoth Yellow soybean variety. *See* Soybean Varieties USA–Mammoth Yellow

Manchu soybean variety. *See* Soybean Varieties USA–Manchu

Manchuria. *See* Asia, East–Manchuria

Manna Foods, Inc. (Scarborough, Ontario, Canada). 764

Manna Natural Foods (Amsterdam, The Netherlands). Named Stichting Natuurvoeding Amsterdam until 1982. Absorbed by Akwarius Almere in 1987. 1000, 1027, 1213

Map / Maps. 94, 153, 188, 296, 322, 327, 496, 529, 618, 633, 721, 723, 815, 857, 1081, 1098, 1296, 1326, 1333

Margarine–Etymology of This Term and Its Cognates / Relatives in Various Languages. 521, 522

Margarine Made with Soy Oil. 200, 235, 283, 418, 442, 1098, 1560, 1583, 1642

Margarine. 321, 350, 385, 521, 522, 549, 592, 635, 645, 857, 1015, 1147, 1278, 1292, 1322, 1591, 1671

Market statistics on soybean production. *See* Soybean Production and Trade–Industry and Market Statistics,

Market statistics. *See* the specific product concerned, e.g. Tofu Industry and Market Statistics

Market studies. *See* Industry and Market Analyses

Marketing–Soyfoods and Soyfood Products. 795, 929

Marketing Soybeans, Market Development, and Economics (Including Futures Markets, Hedging, and Mathematical Models). 350, 480, 549, 625, 663, 664, 761, 775, 857, 1069, 1167, 1225, 1291, 1314, 1424, 1560

Marketing of soyfoods. *See* Individual foods, e.g., Tofu–Marketing of

Markets and Crop Estimates, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Agricultural Economics

Marshall Islands. *See* Oceania–Marshall Islands

Marusan-Ai. *See* Soymilk Companies (Asia)

Massachusetts. *See* United States–States–Massachusetts

Maturity groups. *See* Soybean–Physiology and Biochemistry–Maturity Groups

Mauritius. *See* Africa–Mauritius (Ile Maurice)

Meal or cake, soybean. *See* Soybean Meal

Meals for Millions Foundation (Los Angeles, California) and Multi-Purpose Food (MPF). 506, 525, 541, 559

Meat Alternatives–Beef Alternatives, Including Meatless Beef Jerky, Chili Con Carne, Goulash, Lasagna, Meat Balls, Mince, Mincemeat, Sloppy Joes, Spaghetti Sauce, Steak, Veal, etc. See also Meatless Burgers. 527, 584, 659, 922, 997

Meat Alternatives–Commercial Products (Meatlike Meatless Meat, Poultry, or Fish / Seafood Analogs. See Also Meat Extenders). 997, 1010, 1075

Meat Alternatives–Documents About (Meatlike Meatless Meat, Poultry, or Fish / Seafood Analogs. See Also Meat Extenders). 230, 642, 698, 1203, 1206, 1224

Meat Alternatives–General and Other Meatless Meatlike Products. See Also Meat Extenders. 557, 708, 1080

Meat Alternatives–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1477

Meat Alternatives–Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1230

Meat Alternatives–Meatless Bacon, Bacon Bits, Ham, and Other Pork-related Products. See also Meatless Sausages. 1482

Meat Alternatives–Meatless Burgers and Patties. See Also Meat Extenders. 631, 640, 659, 719, 794, 810, 826, 845, 892, 912, 947, 956, 1119, 1176, 1182, 1210, 1223, 1224, 1239, 1266, 1296, 1301, 1310, 1337, 1390, 1463, 1464, 1589, 1626, 1635, 1667, 1670, 1673, 1687

Meat Alternatives–Meatless Chicken, Goose, Duck, and Related Poultry Products. See also Meatless Turkey. 407, 1464, 1482

Meat Alternatives–Meatless Fish, Shellfish, and Other Seafood-like Products. 407, 922, 945, 1210, 1464

Meat Alternatives–Meatless Sausages (Including Frankfurters, Hot Dogs, Wieners, Salami, Pepperoni, etc.). See Also Meat Extenders. 528, 617, 658, 754, 809, 828, 845, 890, 1003, 1035, 1066, 1099, 1117, 1183, 1210, 1224, 1230, 1241, 1274, 1298, 1343, 1500, 1589

Meat Alternatives–Quorn (Based on Mycoprotein). See Also Meat Extenders. 1658

Meat Products Extended with Soy Protein, or Meat Extenders (Marketed as Such). 347, 698, 707, 709, 733, 795, 1206

Meat alternatives companies. *See* Turtle Island Foods, Inc. (Hood River, Oregon. Maker of Tofurky and Tempeh), Yves Veggie Cuisine (Vancouver, BC, Canada)

Meat alternatives makers. *See* Tivall (Tivol)

Media, Popular Articles on Soyfoods in Europe, or Related to Europeans in Asia. 286, 798

Media, Popular Articles on Soyfoods in the USA, Canada, or Related to North Americans in Asia. 821, 1106

Medical / Medicinal-Therapeutic Aspects (General). 716, 891

Medical aspects of soybeans. *See* Cancer or Tumor Causing / Promoting Substances in Soybeans or, Cognitive / Brain Function, Including Alzheimer's Disease, Diabetes and Diabetic Diets, Kidney / Renal Function, Menopause–Relief of Its Unpleasant Symptoms, Osteoporosis and Bone Health

Medical aspects of vegetarian diets. *See* Vegetarian Diets–Medical Aspects

Medicine–Alternative–Incl. Acupuncture, Chiropractic, Drugless Doctors, Herbal Therapy, Holistic / Wholistic Medicine, Homeopathy, Natural Hygiene, Natural Medicine, Naturopathy, Preventive / Preventative Medicine,. 342, 356, 390, 391, 392, 393, 396, 399, 411, 417, 425, 892, 1371, 1374, 1385, 1386, 1387, 1390, 1696, 1697

Medicine, Chinese Traditional. *See* Chinese Medicine

Meitauza (mei-tou-cha). *See* Fermented Specialty Soyfoods

Membrane Technology Processes–Microfiltration (MF), Ultrafiltration (UF, including Diafiltration), Reverse Osmosis (RO–also known as hyperfiltration, HF), Electrodialysis (ED), and Nanofiltration (NF). 1189, 1238, 1455

Menopause–Relief of Its Unpleasant Symptoms, Such as "Hot Flashes" and "Night Sweats". 1188, 1251, 1396, 1447, 1463, 1498, 1524, 1537, 1540, 1564, 1569, 1573, 1600, 1607, 1623

Mesoamerica. *See* Latin America–Central America

Mexican-style recipes, soyfoods used in. *See* Latin America, Central America–Mexico

Mexico. *See* Latin America, Central America–Mexico

Meyer, Frank N. (1875-1918). USDA Plant Explorer in Asia. 296, 1200

Michigan. *See* United States–States–Michigan

MicroSoy Corporation (Jefferson, Iowa; Osaka, Japan). Formerly Nichii Co. and MYCAL Corp. 1296

Microalgae. *See* Single Cell Proteins (Non-Photosynthetic)

Microbial Proteins (Non-Photosynthetic Single-Cell Proteins, Including Fungi [Mycoproteins such as Quorn], Yeast, and Bacteria). 642, 826

Microbiological Problems (Food Spoilage, Sanitation, and Contamination). See also: Nutrition–Toxins and Toxicity in Foods and Feeds–Microorganisms, Especially Bacteria, as Causal Agents. 1442

Microbiology and fermentation. *See* Fermented Soyfoods and Their Fermentation

Micronesia, Federated States of. *See* Oceania–Micronesia

Microscopic analysis and microscopy. *See* Soybean–Morphology, Structure, and Anatomy of the Plant and Its Seeds as Determined by Microscopy or Microscopic Examination

Middle America. *See* Latin America–Central America; and Latin America–Caribbean or West Indies, Latin America, Central

America, and Latin America, Caribbean or West Indies

Migros & Conserves Estavayer (Estavayer-le-Lac, Switzerland). 1027

Miles Laboratories. *See* Worthington Foods, Inc. (Worthington, Ohio)

Milk, Non-Dairy, Non-Soy Milks and Creams Made from Nuts, Grains, Seeds, or Legumes, Such as Brazil Nuts, Cashews, Coconuts, Filberts, Hazelnuts, Hemp Seeds, Pecans, Pine Nuts, Pumpkin Seeds, Sunflower Seeds, Walnuts, etc. See also: Almond Milk, Amazake / Rice Milk, Peanut / Groundnut Milk, Sesame Milk. 565, 907

Milk, almond. *See* Almond Milk and Cream. Also–Almonds Used to Flavor Soymilk, Rice Milk, etc.

Milk, coconut / cocoanut. *See* Coconut Milk and Cream

Milk, rice. *See* Rice Milk (Non-Dairy)

Milk, soy. *See* Soymilk

Miller, Harry W. (M.D.) (1879-1977) and International Nutrition Laboratory (Mt. Vernon, Ohio). 589, 893, 894, 1240, 1385, 1593, 1713

Minerals (General). 107, 321, 856, 1114, 1235

Minerals. *See* Aluminum in Soybeans and Soyfoods, Calcium Availability, Absorption, and Content of Soy

Minnesota. *See* United States–States–Minnesota

Miso (Japanese-style Soybean Paste). See also: Jiang–for Chinese-style Miso. Jang–for Korean-style Miso. And Taucho, Tauceo, Tau Chiow, Taoco, Tao-Tjo, Taotjo, Taocho, or Taoetjo for Indonesian-style Miso (Soybean Chiang, or Jiang [pinyin]). 64, 66, 73, 74, 95, 107, 118, 130, 296, 310, 312, 321, 385, 402, 406, 430, 497, 662, 683, 719, 763, 764, 815, 817, 821, 822, 935, 938, 988, 1062, 1080, 1088, 1106, 1140, 1163, 1201, 1204, 1211, 1272, 1294, 1409, 1488, 1537, 1539, 1559, 1560, 1575, 1597, 1604, 1611, 1614, 1626, 1638, 1642, 1664, 1687, 1707

Miso–Etymology of This Term and Its Cognates / Relatives in Various Languages. 74

Miso–Imports, Exports, International Trade. 935, 1272, 1611

Miso–Indonesian-style. *See* Tauco–Indonesian-Style Fermented Soybean Paste

Miso Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 497, 763, 938, 1204, 1611

Miso Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1611

Miso Soup–Mainly Japanese. 662, 1201, 1204, 1664

Miso companies (USA). *See* American Miso Co. (Rutherfordton, North Carolina), Miyako Oriental Foods (Baldwin Park, California), South River Miso Co. (Conway, Massachusetts)

Miso, Indonesian-Style–Etymology of This Term and Its Cognates / Relatives in Various Languages. 826

Miso, Non-Soy Relatives (Such as Modern Chickpea Miso, Oat Miso, Etc.). 1204

Miso, Used as an Ingredient in Commercial Products. 1075, 1153

Miso, soybean–Chinese-Style. *See* Jiang–Chinese-Style Fermented Soybean Paste

Missouri. *See* United States–States–Missouri

Mitoku (Tokyo, Japan). 1028, 1088, 1272, 1294, 1604

Mitsui & Co., Ltd. (Mitsui Bussan Kaisha, Japanese Trading Co., founded 1876). 402

Miyako Oriental Foods (Baldwin Park, California). 1604

Mizono family. *See* Azumaya, Inc. (San Francisco, California)

Mochi. *See* Rice-Based Foods–Mochi

Molasses, soy. *See* Soy Molasses or Soy Solubles

Moldavia. *See* Europe, Eastern–Moldova

Monosodium glutamate. *See* MSG

Monsanto Co. (St. Louis, Missouri) and its HybriTech Seed International subsidiary. Acquired Jacob Hartz Seed Co. in April 1983. Acquired Asgrow in April Feb. 1997. Merged with Pharmacia & Upjohn on 31 March 2000 and was renamed Pharmacia Corp. 1505, 1507, 1508, 1509, 1511, 1565, 1583, 1605, 1626, 1705

Moorman Manufacturing Co. *See* Quincy Soybean Products Co. (Quincy, Illinois)

Morinaga Nutritional Foods, Inc., and Morinaga Nyûgyô (Torrance, California, and Tokyo, Japan). 1028, 1170, 1201

Morphology, soybean. *See* Soybean–Morphology, Structure, Anatomy, Soybean–Morphology, Structure, and Anatomy

Morse, William J. (1884-1959, USDA Soybean Expert). 192, 296, 321, 322, 331, 348, 405, 422, 428, 438, 460, 464, 482, 496, 497, 597, 738, 1047

Mottled, speckled, or spotted soybeans. *See* Soybean Seeds–Mottled

Mucuna pruriens. *See* Velvet Bean

Mull-Soy. *See* Borden Inc.

Mung Bean / Mungbean and Mung Bean Sprouts. *Vigna radiata* L. Formerly *Phaseolus aureus*. Also called Green Gram. Chinese–Lüdou. Japanese–Moyashi. Indonesian: Kacang / katjang + hijau / ijo / hidjau. German–Buschbohne. French–Haricot Mungo. 114, 121, 156, 167, 255, 307, 318, 496, 719, 806, 814, 826, 838, 873, 933, 934, 976, 1168, 1188, 1392, 1500

Muramoto, Noboru–His Life and Work with Macrobiotics, Organizations He Founded, and Commercial Products He Made or Inspired. 1604

Muso Shokuhin (Osaka, Japan). 603, 764, 835, 908, 1012, 1088, 1253, 1297, 1299

Mycoprotein used in meat alternatives. *See* Meat Alternatives–Quorn (Based on Mycoprotein)

Myths of soybean history–debunking / dispelling. *See* History of the Soybean–Myths and Early Errors Concerning Its History

Nasoya Foods, Inc. (Leominster, Massachusetts). Subsidiary of Vitasoy Since Aug. 1990. 1213, 1339, 1340, 1685, 1695, 1703, 1706, 1710

National Agricultural Library (USDA, NAL, Beltsville, Maryland). 592

National Biodiesel Board (NBB). Formerly named National Soy Fuels Advisory Committee (NSFAC) (May 1992–Dec. 1992) and National SoyDiesel Development Board (NSDB) (Dec. 1992–Sept. 1994). See also Soy Diesel Fuel, SoyDiesel, or Biodiesel. 1690

National Center for Agricultural Utilization Research (NCAUR) (USDA-ARS) (Peoria, Illinois). Named Northern Regional Research Laboratory prior to July 1976. Named Northern Regional Research Center prior to 28 Dec. 1991. 474, 763, 822, 1676

National Food Research Institute (NFRI) (Tsukuba, Ibaraki-ken, Japan). 1196

National Oilseed Processors Assoc. (NOPA) (National Soybean Oil Manufacturers Association from May 1930 to 1935; National Soybean Processors Assoc. [NSPA] from June 1936 to Aug. 1989. Washington, DC. Including Soy Flour Assoc. [1936-1949], Soya Food Research Council [1936], and Soybean Nutritional Research Council [1937]). 570, 620, 1098

National SoyDiesel Development Board or National Soy Fuels Advisory Committee. *See* National Biodiesel Board

National Soybean Research Laboratory (NSRL, University of Illinois, Urbana, Illinois). 1429

Natto (Whole Soybeans Fermented with *Bacillus natto*). 118, 235, 296, 312, 321, 347, 402, 406, 430, 763, 817, 821, 822, 1080, 1294, 1488, 1626, 1642, 1646, 1659

Natural / Vegetarian Food Products Companies. *See* American Natural Snacks, Boca Burger, Fantastic Foods, Gardenburger

Natural Foods Distributors and Master Distributors (Canada). *See* Lifestream Natural Foods Ltd. (Vancouver then Richmond, British Columbia, Canada), Manna Foods, Inc. (Scarborough, Ontario, Canada)

Natural Foods Distributors and Master Distributors (Japan). *See* Mitoku (Tokyo, Japan), Muso Shokuhin (Osaka, Japan)

Natural Foods Distributors and Master Distributors (USA). *See* Arrowhead Mills (Hereford, Deaf Smith County, Texas), Ceres (Colorado Springs, Colorado), Eden Foods, Inc. (Clinton, Michigan). Founded 4 Nov. 1969, Erewhon (Boston, Massachusetts), Erewhon–Los Angeles / West, Essene Traditional Foods (Philadelphia, Pennsylvania), Great Eastern Sun and Macrobiotic Wholesale Co. (North Carolina), Infinity Food Co. Renamed Infinity Company by 1973 (New York City), Janus Natural Foods (Seattle, Washington), Laurelbrook Natural Foods (Bel Air, Maryland), Tree of Life (St. Augustine, Florida), Well (The), Pure & Simple, and New Age Distributing Co. (San Jose, California), Westbrae Natural Foods, Inc. (Berkeley, California)

Natural Foods Movement and Industry in the United States (Started in the Mid-1950s). 388, 603, 662, 764, 1230, 1237, 1240, 1272

Natural and Health Foods Retail Chains or Supermarkets: Bread & Circus (Tony Harnett, MA), Frazier Farms (Bill Frazier, Southern Calif.), Fresh Fields (Rockville, MD), GNC = General Nutrition Corp. (Pittsburgh, PA), Mrs. Gooch's (Los Angeles, CA), Nature Foods Centres (Wilmington, MA; Ronald Rossetti), Trader Joe's, Whole Foods Market (Austin, TX), Wild Oats. 1297, 1348, 1623

Naturopathic pioneers. *See* Ehret, Arnold

Naturopathy pioneers. *See* Lust, Benedict (1872-1947)

Nauru. *See* Oceania

Near East. *See* Asia, Middle East

Near Infrared Reflectance (NIR) or Transmittance (NIT) Analysis. *See* Seed, Food or Feed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) Anlysis and Spectrophotometry

Nematodes–Disease Control (Nematodes). Early Called Eelworms / Eel-Worms or Gallworms / Gall-Worms that Caused Root-Knot or Root-Gall. 321, 496, 1190, 1505, 1605

Neonotonia wightii (Also called Rhodesian Kudzu Vine, Perennial Soybean, or *Soja perene / Soya Perenne;* Formerly *Glycine javanica* or *Glycine wightii*). 60, 94, 95, 103, 387, 507, 553, 569, 738, 786, 796, 836, 1444

Nestlé (Nestle–The World's Biggest Food Group). 402, 1203, 1430, 1593

Netherlands. *See* Europe, Western–Netherlands

New Caledonia (French Territory of). *See* Oceania–Pacific Ocean Islands that are Part of France–Territory of New Caledonia and Dependencies

New England Soy Dairy. *See* Tomsun Foods, Inc.

New York State Agric. Experiment Station (Geneva, NY). *See* Cornell University (Ithaca, New York)

New York. *See* United States–States–New York

New Zealand. *See* Oceania–New Zealand

Nichii Company. *See* Whole Dry Soybean Flakes

Nigeria. *See* Africa–Nigeria

Nitragin Inoculant and The Nitragin Company. 172

Nitrogen Fixation, Inoculum, Inoculation, and Nodulation by Rhizobium Bacteria. 152, 172, 186, 224, 243, 267, 269, 273, 278, 279, 285, 289, 290, 295, 310, 320, 321, 347, 358, 365, 373, 380, 385, 386, 402, 403, 418, 428, 438, 449, 467, 473, 496, 504, 507, 514, 520, 526, 530, 536, 537, 540, 543, 545, 548, 551, 560, 561, 562, 568, 575, 577, 579, 587, 591, 593, 596, 618, 621, 623, 624, 626, 628, 639, 641, 653, 685, 686, 687, 721, 747, 748, 758, 783, 784, 785, 790, 792, 793, 839, 855, 868, 870, 917, 934, 951, 957, 1126, 1173, 1190

Nitrogen Fixing Cultures / Inoculants (Commercial and Noncommercial from government), of Rhizobium Bacteria for Soybeans (Culture / Inoculant / Inoculum / Inocula). 172, 537, 543, 562, 587, 596, 784, 957

No-till farming. *See* Soybean Cultural Practices–No Till Farming

Noble Bean (Ontario, Canada). Founded by Susan and Allan Brown June 1980. 1659

Nodulation. *See* Nitrogen Fixation, Inoculum, Inoculation, and Nodulation by Rhizobium Bacteria

Nomenclature of Soybean Varieties–Standardization of and Confusion Concerning Names. 321, 428, 482, 1179

Non-dairy products (so-called) made from casein or caseinates. *See* Casein or Caseinates–Problems in So-Called Non-Dairy Products

Non-dairy, non-soy milk. *See* Milk, Non-Dairy, Non-Soy Milks and Creams Made from Nuts, Grains, Seeds, or Legumes

Nordquist, Ted. *See* WholeSoy & Co. (subsidiary of TAN Industries, Inc., California)

North America. *See* United States of America, and Canada. For Mexico, see Latin America, Central America

North Carolina. *See* United States–States–North Carolina

Northern Regional Research Center (NRRC) (Peoria, Illinois). *See* National Center for Agricultural Utilization Research (NCAUR) (USDA-ARS)

Northern Soy, Inc. (Rochester, New York). 800, 1020, 1048, 1055

Nut Butters, Non-Soy. Including Butter Made from Nuts or Seeds, Such as Brazil Nuts, Cashews, Coconuts, Filberts, Hazelnuts, Hickory Nuts, Hemp Seeds, Macadamia Nuts, Pecans, Pignolias, Pine Nuts, Pistachios, Pumpkin Seeds, Sunflower Seeds, Walnuts, etc. See also: Almond Butter, Peanut Butter, Sesame Butter, Soynut Butter. 907

Nut milk or cream. *See* Milk–Non-Dairy Milks and Creams Made from Nuts

Nutraceuticals. *See* Functional Foods or Nutraceuticals

Nutrisoya, Inc. (Quebec). 1588

Nutrition (General). 386, 394, 402, 403, 435, 559, 583, 705, 826, 1234, 1263, 1366, 1372, 1501, 1642, 1694

Nutrition–Acid-Base Balance in Diet and Health, or Individual Foods, or Acid-Alkaline Ash in Diet, or Acid-Forming and Base-Forming Elements in Foods. 376, 377, 395, 435, 440, 481, 1108

Nutrition–Biologically Active Phytochemicals–Allergens, Allergies, and Allergic Reactions Caused (or Remedied) by Soybeans, Soyfoods, Peanuts, or Animal Milks. 609, 1135, 1155, 1359, 1416, 1531

Nutrition–Biologically active phytochemicals. *See* Antioxidants, Phytic Acid, Phytates, and Phytin, Reproductive / Fertility Problems, Saponins, Trypsin / Protease Inhibitors

Nutrition–Biologically active substances. *See* Antinutritional Factors (General), Antivitamin Activity and Antivitamins, Goitrogens and Thyroid Function, Hemagglutinins (Lectins or Soyin)

Nutrition–Carbohydrates. *See* Oligosaccharides

Nutrition–Lipids. *See* Sterols or Steroid Hormones

Nutrition–Medical / Medicinal-Therapeutic Aspects. *See* Chinese Medicine, Traditional

Nutrition–Medical Aspects. *See* Cancer Preventing Substances in Soy, Cancer or Tumor Causing / Promoting Substances in Soybeans or Soyfoods, Cardiovascular Disease, Especially Heart Disease and Stroke, Cognitive / Brain Function, Including Alzheimer's Disease, Diabetes and Diabetic Diets, Kidney / Renal Function, Medical / Medicinal-Therapeutic Aspects (General), Menopause–Relief of Its Unpleasant Symptoms, Osteoporosis and Bone Health

Nutrition–Minerals. *See* Aluminum in Soybeans and Soyfoods, Calcium Availability, Absorption, and Content of Soy

Nutrition–Protein–Early and basic research. *See* Protein–Early and Basic Research

Nutrition–Protein. *See* Amino Acids and Amino Acid Composition and Content

Nutrition Education (Or Lack Thereof in Medical Schools), Food Groups, and Food Pyramids. 617

Nutrition bars. *See* Bars–Energy Bars or Nutrition Bars Made with Soy

Nutrition et Soja, Div. of Nutrition et Santé (Revel near Toulouse, France). Formerly Société Soy (Saint-Chamond, France). 1000, 1027

Nutrition. *See* Carbohydrates (General). See also Starch, Dietary Fiber, and Oligosaccharides (Complex Sugars), Carbohydrates–Dietary Fiber, Carbohydrates–Effects of Dietary Carbohydrates (Especially Fiber and Saponins) on Blood Lipids (Especially Cholesterol), Carbohydrates–Glycemic Index and Glycemic Load, Chemical / Nutritional Composition or Analysis, Claim or Claims of Health Benefits–Usually Authorized by the FDA, Concerns about the Safety, Toxicity, or Health Benefits of Soy in Human Diets, Diet and Breast Cancer Prevention, Diet and Prostate Cancer Prevention, Flatulence or Intestinal Gas, Functional Foods or Nutraceuticals, Human Nutrition–Clinical Trials, Intestinal Flora / Bacteria, Isoflavone or Phytoestrogen Content of Soyfoods, Soy-based Products,, Lactose Intolerance, Lipid and Fatty Acid Composition of Soy, Lipids–Effects on Blood Lipids, Microbiological Problems (Food Spoilage, Sanitation, and Contamination), Minerals (General), Protein–Effects on Blood Lipids, Protein Quality, and Supplementation, Protein Resources and Shortages, and the "World Protein Crisis / Gap / Problem" of 1950-1979, Toxins and Toxicity in Foods and Feeds–Bongkrek Poisoning, Vitamins (General), Vitamins B-12 (Cyanocobalamin, Cobalamins), Vitamins E (Tocopherols)

Nutritional aspects of vegetarian diets. *See* Vegetarian and Vegan Diets–Nutrition / Nutritional Aspects

Nuts made from soybeans. *See* Soynuts

Obituaries, Eulogies, Death Certificates, and Wills. See Also: Biographies, Biographical Sketches and Autobiographies. 369, 570, 830, 1052, 1446

Oceania (General, Also Called Australasia, or Australia and Islands of the Pacific / Pacific Islands). 2, 66, 81, 102, 115, 122, 132, 291, 310, 313, 325, 506, 625, 734, 742, 763, 769, 857, 1014, 1068, 1152, 1154, 1186, 1350, 1424, 1444, 1555, 1559, 1560, 1594, 1597, 1617, 1625, 1641, 1684, 1701

Oceania–Atlantic Ocean Islands that are Part of France–St.-Pierre and Miquelon (two groups of 8 craggy islands located near the southwest coast of Newfoundland)–A French Overseas Territorial Collective. 1701

Oceania–Atlantic Ocean Islands that are Part of the United Kingdom–Ascension (in south Atlantic), British Antarctic Territory (Including South Shetland Islands and South Orkney Islands in south Atlantic), Channel Islands (in English Channel), Fulkland Islands {or Islas Malvinas} and Dependencies (in south Atlantic), Isle of Man (in Irish Sea), South Georgia Islands (in South Atlantic), St. Helena (1,200 miles off the west coast of Africa). 313, 319, 325, 373, 953, 1671, 1680, 1701

Oceania–Australia, Commonwealth of (Including Tasmania, Cocos (Keeling) Islands, Christmas Island, Coral Sea Islands Territory, Norfolk Island, Territory of Ashmore and Cartier Islands, and Australian Antarctic Territory). 1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 26, 27, 28, 29, 30, 32, 33, 37, 38, 44, 50, 52, 53, 54, 55, 56, 59, 60, 61, 62, 64, 65, 67, 70, 71, 72, 73, 74, 76, 77, 79, 80, 81, 87, 90, 91, 92, 93, 94, 95, 98, 99, 103, 104, 105, 107, 108, 110, 111, 112, 114, 115, 118, 119, 121, 123, 128, 131, 133, 135, 136, 138, 139, 140, 141, 143, 144, 145, 146, 148, 149, 151, 152, 153, 154, 156, 157, 158, 159, 160, 161, 163, 165, 166, 168, 169, 171, 172, 174, 175, 179, 182, 183, 184, 187, 190, 191, 192, 195, 196, 200, 201, 204, 205, 208, 209, 210, 211, 212, 214, 215, 217, 218, 219, 221, 222, 223, 224, 225, 226, 227, 228, 230, 233, 234, 235, 236, 241, 242, 243, 244, 246, 248, 249, 251, 254, 255, 256, 258, 259, 260, 261, 262, 263, 264, 267, 268, 269, 273, 278, 279, 280, 283, 284, 286, 287, 290, 293, 294, 296, 297, 298, 301, 303, 306, 307, 308, 309, 311, 312, 313, 314, 315, 316, 317, 319, 320, 321, 322, 324, 325, 326, 327, 328, 331, 332, 333, 334, 335, 336, 337, 338, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 409, 410, 411, 412, 413, 414, 415, 416, 417, 419, 420, 421, 422, 423, 424, 425, 426, 427, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 472, 473, 474, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 507, 508, 509, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 526, 527, 528, 529, 530, 532, 533, 534, 535, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 551, 552, 553, 554, 556, 557, 558, 560, 561, 563, 565, 566, 568, 569, 570, 572, 573, 574, 575, 576, 577, 580, 582, 583, 584, 585, 586, 588, 589, 591, 592, 594, 597, 598, 599, 604, 606, 607, 608, 609, 610, 612, 613, 614, 615, 616, 617, 619, 620, 622, 626, 631, 632, 633, 634, 637, 639, 640, 641, 642, 645, 646, 647, 648, 649, 652, 653, 655, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 668, 670, 671, 672, 673, 675, 676, 677, 678, 679, 680, 681, 683, 684, 685, 686, 687, 689, 692, 693, 695, 696, 697, 698, 700, 701, 702, 703, 704, 706, 707, 708, 709, 710, 711, 712, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 728, 730, 731, 732, 733, 735, 738, 739, 740, 741, 743, 744, 746, 748, 749, 750, 753, 754, 757, 758, 759, 761, 762, 763, 764, 765, 766, 767, 768, 772, 773, 774, 775, 776, 777, 778, 779, 780, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 804, 805, 807, 808, 809, 810, 811, 813, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 832, 833, 834, 835, 836, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 850, 851, 852, 854, 856, 857, 858, 859, 860, 861, 862, 863, 865, 866, 868, 869, 871, 873, 874, 875, 876, 877, 879, 880, 881, 882, 884, 885, 888, 889, 890, 891, 892, 893, 894, 895, 897, 899, 901, 902, 905, 906, 907, 910, 911, 912, 913, 914, 915, 916, 919, 920, 921, 922, 923, 925, 926, 928, 929, 930, 931, 932, 935, 937, 938, 939, 940, 941, 942, 950, 952, 955, 958, 959, 960, 961, 962, 963, 965, 967, 968, 970, 971, 972, 973, 974, 977, 978, 979, 981, 983, 984, 985, 987, 988, 989, 990, 991, 992, 994, 996, 997, 999, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1009, 1010, 1011, 1013, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1037, 1038, 1039, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1064, 1065, 1067, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1089, 1090, 1092, 1093, 1094, 1096, 1097, 1098, 1104, 1105, 1106, 1107, 1108, 1109, 1111, 1115, 1118, 1119, 1120, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1151, 1155, 1157, 1158, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1187, 1188, 1189, 1192, 1193, 1194, 1195, 1196, 1199, 1200, 1201, 1202, 1203, 1204, 1206, 1207, 1208, 1209, 1211, 1212, 1215, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1228, 1229, 1230, 1232, 1233, 1234, 1235, 1237, 1238, 1240, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1254, 1255, 1256, 1257, 1259, 1260, 1261, 1262, 1263, 1264, 1266, 1267, 1268, 1269, 1270, 1273, 1275, 1277, 1278, 1279, 1280, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1303, 1304, 1305, 1306, 1307, 1308, 1310, 1311, 1312, 1314, 1315, 1316, 1318, 1320, 1321, 1322, 1324, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1337, 1339, 1340, 1344, 1347, 1348, 1349, 1351, 1357, 1361, 1362, 1363, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1377, 1380, 1381, 1385, 1386, 1387, 1388, 1389, 1390, 1392, 1394, 1396, 1397, 1400, 1404, 1405, 1406, 1409, 1418, 1424, 1427, 1429, 1430, 1431, 1433, 1438, 1439, 1441, 1442, 1445, 1446, 1447, 1449, 1451, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1461, 1463, 1464, 1465, 1468, 1470, 1476, 1477, 1482, 1485, 1486, 1490, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1502, 1505, 1507, 1508, 1511, 1514, 1515, 1516, 1517, 1524, 1525, 1526, 1528, 1529, 1530, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1550, 1556, 1557, 1558, 1560, 1561, 1563, 1564, 1565, 1568, 1569, 1571, 1572, 1573, 1574, 1578, 1579, 1580, 1581, 1582, 1583, 1586, 1587, 1588, 1589, 1590, 1591, 1593, 1595, 1596, 1598, 1599, 1600, 1602, 1605, 1606, 1607, 1608, 1611, 1612, 1616, 1618, 1619, 1622, 1623, 1624, 1626, 1627, 1629, 1630, 1631, 1632, 1633, 1634, 1636, 1637, 1638, 1639, 1640, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1667, 1668, 1669, 1670, 1672, 1673, 1675, 1676, 1677, 1678, 1679, 1681, 1682, 1683, 1685, 1686, 1688, 1689, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713

Oceania–Fiji. 62, 155, 313, 325, 326, 385, 387, 487, 524, 541, 559, 628, 713, 736, 737, 752, 802, 806, 814, 831, 837, 838, 855, 870, 871, 872, 873, 900, 927, 933, 934, 938, 976, 986, 998, 1002, 1008, 1116, 1142, 1200, 1220, 1243, 1286, 1295, 1390, 1614, 1630, 1690, 1701

Oceania–French Polynesia (French Oceania from about 1903 to sometime between 1946 and 1958. A French Overseas Territory in the South Pacific Ocean, comprising the Marquesas, Society Islands {Including Tahiti}, Gambier, and Tubuai Islands, and the Tuamotu Archipelago). 326, 510, 737, 770, 771, 802, 803, 831, 900, 917, 951, 986, 1063, 1190, 1527, 1701

Oceania–Guam. 313, 318, 323, 325, 326, 559, 938, 1040, 1258, 1345, 1545, 1611, 1630, 1701

Oceania–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain country in Oceania. Soybeans as such have not yet been reported in this country. 3, 21, 559, 1611, 1701

Oceania–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain country in Oceania. Soybeans as such had not yet been reported by that date in this country. 3, 21, 559, 1611, 1701

Oceania–Introduction of Soybeans to. Earliest document seen concerning soybeans (but only wild perennial relatives of soybeans) in a certain country in Oceania; cultivated soybeans have not yet been reported. 1, 2, 19, 62, 94, 103, 153, 155, 367, 553, 1701

Oceania–Introduction of Soybeans to. Earliest document seen concerning soybeans in a certain country in Oceania. 70, 86, 318, 319, 380, 387, 471, 524, 543, 688, 690, 691, 737, 803, 855, 1701

Oceania–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain country in Oceania. 55, 82, 1701

Oceania–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain country in Oceania. 89, 318, 319, 380, 387, 471, 524, 688, 690, 737, 803, 855, 1701

Oceania–Introduction of Soybeans to. This document contains the earliest date seen for soybeans in a certain country in Oceania. 70, 307, 318, 319, 380, 471, 487, 524, 737, 747, 803, 855, 1701

Oceania–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain country in Oceania. 89, 307, 318, 319, 380, 471, 487, 524, 737, 747, 803, 855, 1701

Oceania–Kiribati (Gilbert Islands until 1979). 188, 313, 325, 326, 938, 1504, 1701

Oceania–Marshall Islands, Republic of the. 559, 1630, 1701

Oceania–Micronesia, Federated States of (Named Caroline Islands until 1986. Formerly part of the U.S.-administered Trust Territory of the Pacific Islands). 471, 553, 559, 578, 745, 1081, 1628, 1701

Oceania–Nauru (Naoero: Named Pleasant Island from 1798 to 1888). 938, 1701

Oceania–New Zealand–Including Stewart Island, Chatham Islands, Snares Islands, Bounty Islands, and Tokelau (formerly Union Islands). 21, 22, 23, 25, 31, 34, 35, 36, 39, 40, 41, 42, 43, 45, 46, 47, 48, 49, 51, 57, 58, 63, 68, 69, 75, 78, 82, 83, 84, 85, 86, 88, 89, 96, 97, 100, 101, 106, 109, 113, 116, 117, 120, 124, 125, 126, 127, 129, 130, 134, 135, 136, 137, 142, 147, 150, 157, 162, 164, 170, 173, 176, 177, 178, 180, 181, 185, 186, 189, 193, 194, 197, 198, 199, 202, 203, 206, 207, 213, 216, 220, 221, 227, 229, 231, 232, 234, 237, 238, 239, 240, 245, 247, 250, 252, 253, 257, 259, 263, 265, 266, 270, 271, 272, 274, 275, 276, 277, 278, 281, 282, 285, 288, 289, 292, 295, 299, 300, 302, 304, 305, 313, 319, 324, 325, 326, 329, 330, 339, 385, 388, 408, 418, 428, 430, 431, 453, 467, 486, 522, 529, 531, 536, 550, 567, 571, 590, 593, 603, 621, 627, 629, 630, 635, 643, 645, 650, 651, 656, 683, 698, 714, 718, 727, 732, 756, 759, 763, 794, 795, 805, 812, 830, 848, 849, 853, 878, 883, 887, 889, 892, 894, 904, 908, 909, 918, 924, 936, 938, 969, 980, 1001, 1012, 1036, 1066, 1088, 1094, 1095, 1099, 1100, 1101, 1102, 1103, 1112, 1113, 1114, 1117, 1119, 1121, 1128, 1150, 1153, 1156, 1158, 1159, 1166, 1176, 1177, 1191, 1197, 1198, 1205, 1216, 1224, 1225, 1227, 1240, 1242, 1243, 1247, 1253, 1271, 1272, 1274, 1276, 1281, 1282, 1294, 1299, 1302, 1308, 1309, 1317, 1319, 1323, 1325, 1331, 1336, 1338, 1339, 1341, 1342, 1343, 1346, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1364, 1365, 1366, 1370, 1372, 1373, 1376, 1378, 1379, 1382, 1383, 1384, 1388, 1391, 1393, 1395, 1398, 1399, 1400, 1401, 1402, 1403, 1405, 1407, 1408, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1425, 1426, 1427, 1428, 1431, 1432, 1434, 1435, 1436, 1437, 1440, 1443, 1448, 1450, 1452, 1457, 1460, 1461, 1462, 1466, 1467, 1468, 1469, 1471, 1472, 1473, 1474, 1475, 1476, 1478, 1479, 1480, 1481, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1491, 1501, 1503, 1506, 1508, 1509, 1510, 1512, 1513, 1514, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1531, 1542, 1543, 1544, 1546, 1547, 1548, 1549, 1551, 1552, 1553, 1554, 1562, 1565, 1566, 1567, 1570, 1574, 1575, 1576, 1577, 1578, 1583, 1584, 1585, 1593, 1601, 1603, 1604, 1609, 1610, 1611, 1613, 1615, 1620, 1621, 1626, 1635, 1650, 1654, 1663, 1664, 1665, 1666, 1668, 1674, 1679, 1685, 1687, 1688, 1695, 1701, 1703, 1705, 1706, 1707, 1710, 1711

Oceania–Other Pacific Islands, Including American Samoa, Cook Islands (NZ), Niue (NZ), Northern Mariana Islands (U.S., Including Saipan, Tinian, Rota). And Large Pacific Island Groups–Melanesia, Micronesia, Polynesia. 325, 326, 367, 525, 553, 559, 938, 968, 1081, 1142, 1220, 1243, 1286, 1295, 1611, 1701

Oceania–Pacific Ocean Islands that are Part of France–Territory of New Caledonia *(Nouvelle Calédonie)* and Dependencies. Dependencies are the Loyalty Islands *(Iles Loyauté)*, Isle of Pines *(Ile des Pins–Kunié)*, Belep Archipelago *(Iles Bélep)*, and Huon Islands *(Ile Huon)*. 19, 62, 94, 103, 155, 167, 313, 325, 326, 372, 379, 380, 385, 444, 737, 803, 903, 938, 1008, 1029, 1079, 1110, 1142, 1200, 1220, 1243, 1286, 1295, 1668, 1701

Oceania–Palau, Republic of. 1611, 1701

Oceania–Papua New Guinea, Independent State of (British New Guinea from 1888, then Territory of Papua and New Guinea until Sept. 1975. The northeast was German New Guinea from 1884 to 1914, then Trust Territory of New Guinea). 313, 325, 326, 387, 430, 431, 470, 475, 537, 543, 559, 562, 579, 587, 596, 611, 618, 624, 636, 674, 688, 690, 694, 705, 751, 755, 768, 772, 781, 867, 931, 938, 968, 1060, 1081, 1142, 1200, 1220, 1224, 1243, 1265, 1280, 1286, 1312, 1331, 1340, 1344, 1381, 1630, 1701, 1709

Oceania–Samoa (Formerly Western Samoa; German Samoa until 1914). 326, 559, 855, 864, 896, 938, 957, 964, 1091, 1116, 1701

Oceania–Solomon Islands (British Solomon Islands Protectorate until July 1978). 313, 325, 326, 524, 555, 559, 564, 581, 591, 595, 600, 601, 602, 605, 623, 628, 636, 638, 644, 654, 667, 669, 682, 729, 745, 760, 938, 993, 1630, 1701

Oceania–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 460, 464, 472, 474, 481, 532, 533, 582, 591, 598, 599, 626, 653, 660, 664, 682, 689, 727, 748, 766, 792, 839, 857, 865, 932, 1017, 1124, 1180, 1313, 1331, 1332, 1424, 1560, 1678, 1701

Oceania–Tonga, Kingdom of. 155, 313, 325, 326, 559, 691, 699, 737, 747, 796, 938, 1142, 1200, 1220, 1243, 1286, 1295, 1701

Oceania–Tuvalu (The Ellice Islands part of the Gilbert and Ellice Islands Colony before 1976). 313, 325, 326, 938, 1701

Oceania–Vanuatu, Republic of (Named New Hebrides until 1980). 155, 313, 325, 559, 803, 938, 966, 1029, 1200, 1220, 1243, 1286, 1295, 1701

Off flavors. *See* Flavor Problems

Ohio Miso Co. (Founded in 1979 by Thom Leonard and Richard Kluding). *See* South River Miso Co. (Conway, Massachusetts)

Ohio. *See* United States–States–Ohio

Ohsawa, George and Lima–Their Life and Work with Macrobiotics (Also Sakurazawa Nyoichi, or Georges Ohsawa). 557, 683

Oil, soy–industrial uses of, as a drying oil. *See* Binder for Sand Foundry Cores, Industrial Uses of Soy Oil, Linoleum, Floor Coverings, Oilcloth, and Waterproof Goods, Resins, Plastics, and Plasticizers (Such as Epoxidized Soy Oil–ESO), Rubber Substitutes or Artificial / Synthetic Rubber (Factice)

Oil, soy–industrial uses of, as a hydrogenated oil. *See* Candles, Crayons, and Soybean Wax

Oil, soy–industrial uses of, as a non-drying oil. *See* Diesel Fuel, SoyDiesel, or Biodiesel. See also: Petroleum, Artificial. Explosives Made from Glycerine, Illumination or Lighting by Burning Soy Oil in Wicked Oil Lamps Like Kerosene, Lubricants, Lubricating Agents, and Axle Grease for Carts, Release or Curing Agents for Concrete or Asphalt, Industrial Solvents, Hydraulic Fluids, and Other Minor or General Uses, Soaps or Detergents

Oil, soy, constants. *See* Soy Oil Constants

Oil, soy, industrial uses of, as a drying oil. *See* Industrial Uses of Soy Oil

Oil, soy. *See* Soy Oil

Okara. *See* Fiber–Okara or Soy Pulp, Fiber, Soy

Oligosaccharides (The Complex Sugars Raffinose, Stachyose, and Verbascose). 1078, 1238

Olive / Olives *(Olea europea)*. See also Olive Oil. 122, 132, 326

Olive Oil. 104, 122, 132, 211, 313, 326, 395, 1153

Omega-3 fatty acids. *See* Linolenic Acid–Omega-3 Fatty Acid Content of Soybeans and Soybean Products

Oncom, Onchom, or Ontjom. *See* Tempeh, Non-Soy Relatives

Ontario. *See* Canadian Provinces and Territories–Ontario

Organic Soybean Production (Commercial). See also: Soybean Production: Organically Grown Soybeans or Soybean Prodcts in Commercial Food Products. 981, 1239, 1465, 1700, 1708, 1712

Organically Grown Soybeans or Soybean Products in Commercial Food Products. 948, 950, 960, 962, 963, 973, 977, 1028, 1159, 1176, 1177, 1211, 1219, 1264, 1267, 1283, 1310, 1525

Organoleptic evaluation. *See* Taste Panel, Taste Test Results, or Sensory / Organoleptic Evaluation

Origin, Evolution, Domestication, and Dissemination of the Soybean (General). 105, 166, 496, 681, 787, 1152, 1429

Origins, Evolution, Domestication, and Dissemination of Soybeans (General). 172, 230, 256, 258, 307, 347, 1200, 1247

Osteoporosis and Bone Health. 1114, 1251, 1447, 1463, 1466, 1499, 1537, 1540, 1568, 1619

P.I. numbers of soybeans. *See* Introduction of Soybeans (as to a Nation, State, or Region, with P.I. Numbers for the USA) and Selection, Lists and Descriptions (Official and / or Extensive) of Early U.S. Soybean Varieties with Their P.I. Numbers and Synonyms

PMS Foods, Inc. *See* Far-Mar-Co., Inc.

Pacific Foods of Oregon, Inc. (Tualatin, Oregon). 1406, 1598, 1713

Pacific Islands. *See* Oceania

Packaging Equipment. 1137, 1229

Packaging Innovations and Problems. 1170, 1213

Paints (Especially Water-Based Latex Paints)–Industrial Uses of Soy Proteins. 438

Paints, Varnishes, Enamels, Lacquers, and Other Protective / Decorative Coatings–Industrial Uses of Soy Oil as a Drying Oil. 192, 235, 287, 296, 321, 385, 407, 418, 474, 592, 599, 942

Pakistan. *See* Asia, South–Pakistan

Paper Coatings or Sizings, or Textile Sizing–Industrial Uses of Soy Proteins. 438, 1047, 1302

Papua New Guinea. *See* Oceania–Papua New Guinea

Pasture from green soybean plants. *See* Feeds / Forage from Soybean Plants–Pasture, Grazing or Foraging

Pasture from soybeans. *See* Forage from Soybean Plants–Hogging Down

Patents–References to a Patent in Non-Patent Documents. 521, 592, 672, 673, 1047, 1050, 1170, 1430, 1466, 1507, 1540, 1587, 1588, 1590, 1598, 1600, 1626, 1713

Patties, meatless. *See* Meat Alternatives–Meatless Burgers and Patties

Peanut / Peanuts *(Arachis hypogaea* or *A. hypogæa)*–Also Called Groundnut, Earthnut, Monkey Nut, Goober / Gouber Pea, Ground Pea, or Pindar Pea / Pindars. 60, 64, 74, 94, 95, 103, 104, 119, 122, 128, 132, 133, 140, 143, 145, 149, 156, 167, 196, 255, 296, 304, 306, 311, 313, 316, 318, 320, 325, 326, 388, 420, 427, 471, 480, 487, 507, 521, 522, 524, 537, 538, 539, 543, 583, 587, 595, 596, 600, 617, 618, 619, 624, 636, 638, 688, 705, 719, 736, 759, 806, 814, 826, 838, 844, 855, 871, 873, 891, 927, 933, 934, 976, 988, 1023, 1047, 1098, 1153, 1224, 1260, 1348, 1531, 1560, 1607, 1631, 1650, 1689

Peanut Butter. 388, 427, 617, 719, 759, 1153, 1224, 1260, 1607, 1650

Peanut Meal or Cake (Defatted). 95, 196, 304

Peanut Oil. 95, 122, 132, 313, 427, 521, 522, 854, 867, 1038, 1042

Peanuts–Historical Documents Published before 1900. 94, 95, 103

Peanuts *(Arachis hypogaea* or *A. hypogæa)*–Yield Statistics on Peanut Production. 524

Peking / Pekin soybean variety. *See* Soybean Varieties USA–Mammoth Yellow

Pellets Made from Soybean Meal or Cake. Also Called Soybean Pellets. 811

Periodicals–American Soybean Association. *See* American Soybean Association (ASA)–Periodicals

Periodicals–Soyfoods Movement. *See* Soyfoods Movement–Periodicals

Pesticides (General). 592

Phaseolus limensis or P. lunatus. *See* Lima Bean

Philippines. *See* Asia, Southeast–Philippines

Photographs Published after 1923. See also Illustrations. 192, 332, 335, 336, 342, 347, 348, 368, 388, 403, 409, 410, 436, 438, 449, 455, 460, 470, 473, 475, 488, 496, 498, 510, 511, 523, 525, 528, 533, 539, 541, 542, 552, 557, 570, 586, 589, 591, 603, 604, 608, 625, 626, 631, 658, 662, 677, 707, 721, 732, 788, 809, 810, 815, 835, 841, 845, 863, 886, 890, 896, 922, 967, 975, 995, 1028, 1035, 1037, 1038, 1042, 1082, 1089, 1097, 1098, 1118, 1145, 1191, 1198, 1204, 1206, 1207, 1208, 1213, 1219, 1224, 1246, 1259, 1279, 1282, 1337, 1354, 1355, 1357, 1361, 1362, 1363, 1375, 1386, 1390, 1396, 1410, 1412, 1420, 1429, 1438, 1439, 1443, 1450, 1463, 1468, 1489, 1495, 1502, 1506, 1537, 1551, 1579, 1580, 1581, 1582, 1597, 1602, 1604, 1609, 1610, 1617, 1632, 1635, 1638, 1642, 1643, 1644, 1664, 1667, 1674, 1682, 1685, 1695, 1699, 1703, 1707, 1710

Photographs Published before 1924. See also Illustrations. 192, 217, 218, 226, 243, 246, 289, 296, 310, 311, 318

Photographs, Not About Soy, Published after 1923. See also Illustrations. 393, 411, 412

Photoperiodism. *See* Soybean–Physiology–Photoperiodism / Photoperiod and Photoperiodic Effects, Soybean–Physiology and Biochemistry

Physical Fitness, Physical Culture, Endurance, Athletics, and Exercise. 211, 388, 565, 1108

Phytic Acid (Inositol Hexaphosphate), Phytates / Phytate, and Phytin. 869, 1049, 1056, 1238, 1336, 1338, 1341, 1342, 1546

Phytochemicals in soybeans and soyfoods. *See* Cancer Preventing Substances in Soybeans and Soyfoods

Phytoestrogen content. *See* Isoflavone or Phytoestrogen Content of Soyfoods, Soy Ingredients, and Soybean Varieties

Phytoestrogens in soybeans and soyfoods. *See* Estrogens

Pigeon Pea, Pigeonpea or Red Gram. *Cajanus cajan* (L.) Millspaugh. Formerly *Cytisus cajan*. 114, 121, 156, 167, 255, 318, 335, 336, 487, 503, 814, 826, 838, 855, 871, 873, 927, 933, 934, 976, 1091

Pigs, Hogs, Swine, Sows, Boars, Gilts, or Shoats / Shotes Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed to Make Pork. 190, 191, 214, 223, 321, 694, 846, 1116

Pioneer Hi-Bred International, Inc. (Des Moines, Iowa). 1578, 1648

Piper, Charles Vancouver (1867-1926, USDA). 192, 296, 321, 322, 597

Pitman Health Food Company (Birmingham, England). Including Pitman Stores. Factory renamed Vitaland in about 1930. 375

Plamil Foods Ltd. (Folkestone, Kent, England) and The Plantmilk Society. Named Plantmilk Ltd. until 1972. 640, 798, 1278

Plant Industry, Bureau of. *See* United States Department of Agriculture (USDA)–Bureau of Plant Industry

Plant Protection from Diseases, Pests and Other Types of Injury (General). 987, 1350

Plantmilk Ltd. *See* Plamil Foods Ltd.

Plastics (Including Molded Plastic Parts, Plastic Film, Disposable Eating Utensils and Tableware–From Spoons to Plates, and Packaging Materials)–Industrial Uses of Soy Proteins. 418, 430, 438, 473, 1047

Plastics, plasticizers and resins. *See* Resins, Plastics, and Plasticizers (Such as Epoxidized Soy Oil–ESO)

Plums (salted / pickled), plum products, and the Japanese plum tree *(Prunus mumé)*.. *See* Umeboshi

Policies and Programs, Government, Effecting Soybean Production, Marketing, Prices, Subsidies, or Trade. 625, 762, 775, 862, 1207, 1225, 1314

Pollination, Soybean (Self-Pollination, Cross-Pollination, etc.). 374, 1647, 1648

Population Growth (Human) and Related Problems (Including Poverty) Worldwide. 734

Pork, meatless. *See* Meat Alternatives–Meatless Bacon, Ham, and Other Pork-related Products

Poultry fed soybeans. *See* Chickens, or Turkeys, or Geese & Ducks

Poultry, meatless. *See* Meat Alternatives-- Meatless Chicken, Goose, Duck, and Related Poultry Products. See also Meatless Turkey

Poverty, world. *See* Population Growth (Human) and Related Problems (Including Poverty)

Prices of Soybeans, Soybean Products, and Soybean Seeds. 188, 273, 304, 323, 473, 762, 916, 1527

ProSoya–Including ProSoya Inc. (Ontario, Canada), and ProSoya Corporation (Heuvelton, New York. No longer in Business), ProSoya UK Ltd. (ProSoya PLC) (Livingston, Scotland). Pacific ProSoya Foods, International ProSoya Corp. (IPC–British Columbia). 1561, 1587, 1588, 1590, 1591, 1598, 1627, 1681, 1691

Procter & Gamble Co. (Cincinnati, Ohio). Including the Buckeye Cotton Oil Co. 521, 1047, 1690

Production of soybeans. *See* Soybean Production

Products, soy, commercial (mostly foods). *See* Commercial Soy Products–New Products

Protease inhibitors. *See* Trypsin / Protease Inhibitors

Protection of soybeans from diseases. *See* Diseases of soybeans

Protection of soybeans. *See* Insects–Pest Control. See also: Integrated Pest Management, Nematodes–Disease Control, Pesticides (General), Rodents and Birds–Pest Control–Especially Rabbits and Woodchucks

Protein–Early and Basic Research. 74, 95, 321, 395, 529, 651, 1037

Protein–Effects of Dietary Protein (Especially Soy Protein) on Blood Lipids (Especially Cholesterol). 735, 818, 850, 852, 881, 1311, 1612, 1652

Protein Quality, and Supplementation / Complementarity to Increase Protein Quality of Mixed Foods or Feeds. See also Nutrition–Protein Amino Acids and Amino Acid Composition. 377, 565, 694, 714, 717, 733, 820, 1023, 1206

Protein Resources and Shortages, and the "World Protein Crisis / Gap / Problem" of 1950-1979. 597, 821

Protein Technologies International (PTI) (St. Louis, Missouri. Established on 1 July 1987 as a Wholly-Owned Subsidiary of Ralston Purina Co.) Sold to DuPont on 3 Dec. 1997. 1296, 1325, 1357, 1382, 1508, 1509, 1540, 1578, 1600, 1623, 1665

Protein products, soy. *See* Soy Protein Products

Protein quantity and quality in vegetarian diets. *See* Vegetarian Diets–Nutritional Aspects–Protein Quantity and Quality

Protein sources, alternative, from plants. *See* Amaranth, Azuki Bean, Bambarra groundnuts, Chufa *(Cyperus esculentus)* or Earth Almonds, Leaf Proteins, Lupins or Lupin, Microbial Proteins (Non-Photosynthetic), Peanut & Peanut Butter, Peanuts & Peanut Butter, Quinoa, Single Cell Proteins (Non-Photosynthetic), Sunflower Seeds, Wheat Gluten & Seitan, Winged Bean

Protein supplementation / complementarity to increase protein quality. *See* Nutrition–Protein Quality

Psophocarpus tetragonolobus. *See* Winged Bean

Public Law 480 (Food for Peace Program. Formally–Agricultural Trade Development and Assistance Act of 1954). 549, 713, 729, 760, 763, 989, 1098

Puddings. *See* Soy Puddings, Custards, Parfaits, or Mousses (Usually made from Soymilk

Pueraria. *See* Kudzu or Kuzu

Puero. *See* Kudzu or Kuzu–Tropical Kudzu or Puero *(Pueraria phaseoloides)*

Pure & Simple. *See* Well (The), Pure & Simple

Quality and grades of soybean seed. *See* Seed Quality of Soybeans–Condition, Grading, and Grades (Moisture, Foreign Material, Damage, etc.)

Quincy Soybean Products Co. (Quincy, Illinois). Purchased by Moorman Manufacturing Co. in 1961 and Renamed Quincy Soybean Company. Purchased by ADM in 1998. 570, 1061, 1199

Quinoa *(Chenopodium quinoa* Willd.). Also spelled Quinua. 64, 1166

Quong Hop & Co. (South San Francisco, California). 1020, 1055, 1213

Quorn. *See* Meat Alternatives–Quorn (Based on Mycoprotein)

Québec. *See* Canadian Provinces and Territories–Québec

Rabbits as pests. *See* Rodent and Birds–Pest Control–Especially Rabbits and Woodchucks

Railroad / railway / rail used to transport soybeans. *See* Transportation of Soybeans or Soy Products to Market by Railroad

Ralston Purina Co. (St. Louis, Missouri). Including Protein Technologies International, a Wholly Owned Subsidiary from 1 July 1987 to 3 Dec. 1997. 698, 795, 1047, 1296, 1325, 1357, 1382, 1463, 1508, 1509

Rapeseed Meal. 64, 74, 95

Rapeseed Oil. 122, 132, 313, 325, 844, 854, 887, 929, 1036, 1038, 1042, 1098, 1147, 1176

Rapeseed or the rape plant. *See* Canola

Rapeseed, the Rape Plant *(Brassica napus)*, or Colza. See also Canola. 64, 122, 132, 133, 313, 325, 326, 717, 857, 909, 1098, 1424, 1560

Raw / uncooked / unfired food foods and diet. *See* Vegetarianism–Raw / Uncooked / Unfired Foods and Diet

Recipes. *See* Cookery

Red rice. *See* Rice, Red Fermented

Red soybeans. *See* Soybean Seeds–Red

Regional Soybean Industrial Products Laboratory (Urbana, Illinois). *See* U.S. Regional Soybean Industrial Products Laboratory (Urbana, Illinois). Founded April 1936)

Regulations or Laws Concerning Foods (Use, Processing, or Labeling), Especially Soyfoods and Food Uses of Soybeans. 264, 592, 635, 794, 1048, 1138, 1205, 1302

Regulations or laws concerning foods (Use, processing, or labeling). *See* Kosher / Kashrus, Pareve / Parve / Parevine Regulations Products (Commercial), Kosher Products (Commercial)

Release or Curing Agents for Concrete or Asphalt, Industrial Solvents, Hydraulic Fluids, Asphalt Sealants, and Other Minor or General–Industrial Uses of Soy Oil as a Non-Drying Oil. 296

Religious aspects of vegetarianism. *See* Vegetarianism–Religious Aspects

Rella Good Cheese Co. (Santa Rosa, California). Named Brightsong Tofu from June 1978 to June 1980; Redwood Valley Soyfoods Unlimited from June 1980 to June 1982; Brightsong Light Foods from June 1982 to June 1987; Rose International until 1990; Sharon's Finest until Oct. 1997. 1048, 1115

Reproduction / Reproductive or Fertility Problems in Animals Caused by Phytoestrogens, Isoflavones, or Unknown Causes. 382, 513, 550, 1325, 1336, 1338, 1341, 1342, 1352, 1353, 1354, 1358, 1364, 1365, 1370, 1379, 1383, 1384, 1391, 1395, 1396, 1399, 1402, 1407, 1412, 1416, 1420, 1421, 1426, 1434, 1447, 1448, 1461, 1468, 1472, 1474, 1476, 1480, 1483, 1485, 1520, 1531, 1546, 1547, 1548, 1552, 1553

Republic of China (ROC). *See* Asia, East–Taiwan

Research & Development Centers. *See* (EMBRAPA) (Brazil), Cornell University (Ithaca, New York), and New York State Agric. Exp. Station, Illinois, University of (Urbana-Champaign, Illinois). Soyfoods, National Center for Agricultural Utilization Research (NCAUR) (USDA-ARS) (Peoria, Illinois), National Food Research Institute (NFRI) (Tsukuba, Ibaraki-ken, Japan), U.S. Regional Soybean Industrial Products Laboratory (Urbana, Illinois). Founded April 1936)

Research on Soybeans. 519, 613, 665, 742, 868, 925, 1030, 1151, 1190, 1195

Resins, Plastics, and Plasticizers (Such as Epoxidized Soy Oil–ESO)–Industrial Uses of Soy Oil as a Drying Oil. 592, 599, 942

Restaurants or cafeterias, vegetarian or vegan. *See* Vegetarian or Vegan Restaurants

Restaurants, Chinese, outside China, or Chinese recipes that use soy ingredients outside China. *See* Asia, East–China–Chinese Restaurants Outside China

Restaurants, Indonesian, outside Indonesia, or Indonesian recipes that use soy ingredients outside Indonesia. *See* Asia, Southeast–Indonesia–Indonesian Restaurants Outside Indonesia

Restaurants, Japanese, outside Japan, or Japanese recipes that use soy ingredients outside Japan. *See* Asia, East–Japan–Japanese Restaurants or Grocery Stores Outside Japan

Reunion. *See* Africa–Reunion (Réunion is a Department of France)

Reverse osmosis. *See* Membrane Technology Processes

Reviews of the literature. *See* Bibliographies and / or Reviews of the Literature

Rhizobium bacteria. *See* Soybean Production–Nitrogen Fixation

Rice Milk (Non-Dairy)–Amazake, Made with Rice Koji in the Traditional Way (Without Adding Commercial Enzymes). Also called Rice Milk or Rice Drink. 1294

Rice Milk (Non-Dairy)–Made with Commercial Enzymes, or a Mixture of Commercial Enzymes and Rice Koji. 1449

Rice Milk Products–Ice Creams (Non-Dairy). 1048

Rice Syrup and Yinnies (Called Mizuamé or Amé in Japan). 1166

Rice koji. *See* Koji

Rice wine. *See* Sake

Rice, Red Fermented (Also Called Ang-Kak / Angkak, Hongqu in Chinese / Pinyin, Hung Ch'ü in Chinese / Wade-Giles, or Beni-Koji in Japanese). Made with the Mold *Monascus purpureus* Went, and Used as a Natural Red Coloring Agent (as with Fermented Tofu). 307

Rice-Based Foods–Mochi (Cakes of Pounded, Steamed Glutinous Rice). 948

Rich Products Corporation (Buffalo, New York). 1050, 1322

Richards, Michael. *See* SoyaWax International

Roads or highways used to transport soybeans. *See* Transportation of Soybeans or Soy Products to Market by Roads or Highways

Roasted Whole Soy Flour (Kinako–Dark Roasted with Dry Heat, Full-Fat). 386, 402, 403, 763, 821, 822, 826, 989, 1386, 1388

Roberts, F.G. *See* Soy Products of Australia Pty. Ltd.

Rodale Press (Emmaus, Pennsylvania). 1023

Rodents and Birds–Pest Control–Especially Rabbits, Jackrabbits / Jack Rabbits, Hares, Woodchucks, Pigeons and Pheasants. 246, 267, 320, 338, 496, 539

Royal Wessanen NV Co. *See* Tree of Life (St. Augustine, Florida)

Rubber Substitutes or Artificial / Synthetic Rubber (Factice)–Industrial Uses of Soy Oil as a Drying Oil. 235, 239, 260, 283, 385, 407

Russia. *See* Europe, Eastern–Russia

Rust, soybean. *See* Rust, Soybean

Safety concerns about soy in human diets. *See* Concerns about the Safety, Toxicity, or Health Benefits of Soy in Human Diets

Saishikomi. *See* Soy Sauce–Saishikomi

Sake–Rice Wine. In Japanese also spelled Saké, Saki, Sakki, Sacke, Sackee, Saque. In Chinese spelled Jiu (pinyin) or Chiu (Wade-Giles). 74

Samoa. *See* Oceania–Samoa

San Jirushi Corp., and San-J International (Kuwana, Japan; and Richmond, Virginia). Purchased in Nov. 2005 by Yamasa Corporation. 1014, 1159

Sandoz AG (Basel, Switzerland). Merged with Ciba-Geigy in March 1996 to Become Novartis. 640, 798, 1000, 1027

Sanitarium Health Food Company (Wahroonga, NSW, Australia). In 2002 they acquired SoyaWorld of British Columbia, Canada. 211, 263, 381, 409, 453, 508, 511, 527, 528, 617, 631, 658, 659, 668, 707, 708, 709, 754, 759, 794, 809, 810, 811, 863, 877, 879, 888, 893, 907, 922, 997, 1035, 1109, 1137, 1144, 1187, 1203, 1209, 1219, 1221, 1223, 1224, 1229, 1234, 1235, 1237, 1238, 1240, 1254, 1259, 1260, 1261, 1262, 1263, 1275, 1278, 1293, 1327, 1357, 1386, 1390, 1404, 1409, 1477, 1495, 1508, 1511, 1516, 1528, 1537, 1550, 1561, 1589, 1591, 1595, 1598, 1607, 1626, 1627, 1644, 1650, 1681, 1687, 1688, 1691, 1692

Sanitation and spoilage of food. *See* Microbiological Problems (Food Spoilage, Sanitation, and Contamination)

Saponins (Bitter Carbohydrates / Glucosides That Cause Foaming). 818, 824, 846, 850, 852, 881, 891, 1013, 1132, 1202, 1336, 1338

Sauce, soy nugget. *See* Soy Nugget Sauce

Sausages, meatless. *See* Meat Alternatives–Meatless Sausages

School Lunch Program. 1626

Scotland. *See* Europe, Western–Scotland (Part of United Kingdom)

Screw presses. *See* Soybean Crushing–Equipment–Screw Presses and Expellers

Sea Vegetables or Edible Seaweeds, Often Used with Soyfoods. 64, 74, 172, 328, 565, 640, 662, 683, 778, 835, 908, 967, 1253, 1274, 1297, 1343, 1348, 1575

Seafood, meatless. *See* Meat Alternatives–Meatless Fish, Shellfish, and Other Seafood-like Products

Seaweeds, edible. *See* Sea Vegetables

Second Generation Soyfood Products. 890

Seed Certification and Certified Seeds (Soybeans). 321

Seed Color (Soybeans)–Gives the Color of Seed (and Often Hilum) for Various Specific Varieties. See also: Soybean Seeds of Different Colors. 285, 295, 467, 496, 628

Seed Companies and Seedsmen, Early Soybean, Worldwide (Especially Before 1925)–Including Siebold & Co., Vilmorin-Andrieux, Wood & Sons, Haage & Schmidt, Dammann & Co., Peter Henderson, Thorburn & Co., Mark W. Johnson, Johnson & Stokes, Harry N. Hammond, Burpee, E.E. Evans, Funk Bros. Seed Co. 115, 281, 357, 373, 738, 1179

Seed Germination or Viability–Not Including Soy Sprouts. 243, 298, 306, 320

Seed Quality of Soybeans–Condition, Grading, and Grades (Moisture, Foreign Material, Damage, etc.). 332, 481, 868, 1164

Seed Quality, Composition, and Component / Value-Based Pricing (Percentage and Quality of Protein, Oil, Fatty Acids, etc.). 804

Seed Weight / Size (Soybeans)–Weight of 100 Seeds in Grams, or Number of Seeds Per Pound or Per Kilogram, and Agronomic Significance of Seed Weight. 167, 285, 295, 871, 896, 1624

Seed and plant introduction to the USA. *See* United States Department of Agriculture (USDA)–United States Department of Agriculture (USDA)–Section of Foreign Seed and Plant Introduction

Seed companies, soybean. *See* Asgrow (Des Moines, Iowa), Coker Pedigreed Seed Co. (Hartsville, South Carolina), DeKalb Genetics. Including DeKalb-Pfizer Genetics (DeKalb, Illinois), DuPont (E.I. Du Pont de Nemours & Co., Inc.) (Wilmington, Delaware), Evans Seed Co. (West Branch, Ogemaw County, Michigan) and Mr. Edward Ellsworth Evans (1864-1928), Funk Brothers Seed Co. (Bloomington, Illinois), Monsanto Co. (St. Louis, Missouri), Pioneer Hi-Bred International, Inc. (Des Moines, Iowa), Wing Seed Co. (Mechanicsburg, Champaign County, Ohio)

Seed quality development in soybeans. *See* Breeding or Evaluation of Soybeans for Seed Quality, such as Low in Trypsin Inhibitors, Lipoxygenase, Linolenic Acid, etc.

Seed, Food or Feed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) or Transmitance (NIT) Anlysis and Spectrophotometry. 1200

Seeds, soybean–Variety development and breeding of soybeans. *See* Variety Development and Breeding

Seitan. *See* Wheat Gluten Made into Seitan

Sensory evaluation. *See* Taste Panel, Taste Test Results, or Sensory / Organoleptic Evaluation

Serbia and Montenegro. *See* Europe, Eastern–Serbia and Montenegro

Sesame Butter, Tahini / Tahina / Tahin, or Sesame Paste. 565, 662, 719, 1343, 1348, 1513, 1575

Sesame Meal or Cake (Defatted). 74, 122, 132, 304

Sesame Oil. 64, 122, 132, 313, 325, 565, 1673

Sesame Seed *(Sesamum indicum)* (Also Called Ajonjoli, Benne, Benni, Benniseed, Gingelly, Gingely, Gingelie, Jinjili, Sesamum, Simsim, Teel, Til). Including Sesame as an Oilseed, Sesame Flour, and Sesame Salt / Gomashio. See also Sesame Butter / Tahini, Sesame Cake or Meal, Sesame Milk, and Sesame Oil. 64, 104, 119, 122, 132, 304, 313, 325, 496, 528, 565, 614, 826, 1005, 1072, 1266, 1270, 1673

Sesamum indicum. *See* Sesame Seed

Seventh-day Adventist work with vegetarianism. *See* Vegetarianism–Seventh-day Adventist Work with

Seventh-day Adventist writings or products (especially early) related to dietary fiber. *See* Fiber–Seventh-day Adventist Writings or Products

Seventh-day Adventists–Cookbooks and Their Authors, Dietitians and Nutritionists–Ella E.A. Kellogg (1852-1920), Anna L. Colcord (1860?-1940?), Jethro Kloss (1863-1946), Almeda Lambert (1864-1921), Lenna Frances Cooper (1875-1961), Julius G. White (1878-1955), Frances Dittes (1891-1979), Edyth Cottrell (1900-1995), Dorothea Van Gundy Jones (1903-1979), Philip S. Chen (1903-1978), Frank & Rosalie Hurd (1936-), etc. 369, 502, 617, 830, 1537

Seventh-day Adventists–General and Historical. 729, 760, 955, 1380

Seventh-day Adventists–Influence Today of Seventh-day Adventist Affiliated Organizations in the Fields of Vegetarianism, Health, and Soyfoods (Not Including Original Medical Research on Adventists). 877, 879, 1106, 1345, 1482, 1541, 1627

Seventh-day Adventists–Overseas Companies Making Soyfoods (Europe). *See* DE-VAU-GE Gesundkostwerk GmbH (Lueneburg, Germany), Granose Foods Ltd. (Bucks., England)

Seventh-day Adventists–Overseas Companies Making Soyfoods (Europe, Asia, and Latin America). Other, Including Alimentos Colpac, Nutana, Saniku / San-iku Foods, Superbom. 360, 368, 381, 390, 391, 393, 395, 397, 399, 400, 401, 409, 410, 411, 423, 424, 432, 436, 450, 481, 500, 508, 516, 566, 713, 729, 751, 760, 794, 877, 879, 893, 894, 1034, 1144, 1209, 1229, 1237, 1240, 1268, 1275, 1294, 1374, 1385, 1386, 1387, 1388, 1389, 1390, 1713

Seventh-day Adventists–Overseas Companies Making Soyfoods (Oceania). *See* Sanitarium Health Food Company (Wahroonga, Australia)

Seventh-day Adventists. *See* Kellogg, John Harvey (M.D.), Sanitas Nut Food Co. and Battle Creek Food Co., Kellogg, Will Keith,... Kellogg Co., Loma Linda Foods (Riverside, California), Loma Linda University (Loma Linda, California), Miller, Harry W. (M.D.) (1879-1977), Van Gundy, Theodore A., and La Sierra Industries (La Sierra, California), White, Ellen G (1827-1915), Worthington Foods, Inc. (Worthington, Ohio)

Seychelles. *See* Africa–Seychelles, Republic of

Sharon's Finest. *See* Rella Good Cheese Co.

Sheep, Lambs, Ewes, or Rams Fed Soybeans, Soybean Forage, or Soybean Cake or Meal as Feed to Make Wool or Mutton. 226, 321, 820

Shennong / Shen Nung. *See* Asia, East–China–Shennong / Shên Nung / Shen Nung

Shiro shoyu. *See* Soy Sauce, Clear *(Shiro Shoyu)*

Shortening. 347, 390, 418, 442, 521, 522, 549, 857, 1098, 1147, 1560

Shoyu. *See* Soy Sauce

Shurtleff, William. *See* Soyinfo Center (Lafayette, California)

Siebold, Philipp Franz von (1796-1866)–German Physician and Naturalist. 328, 1333

Silage, soybean. *See* Feeds / Forage from Soybean Plants–Forage Used for Silage / Ensilage

Sinaiko Family of Madison, Wisconsin–Incl. Joe Sinaiko of Iowa Milling Co. and Decatur Soy Products Co. (1891-1988), His Brother Ike Sinaiko of Illinois Soy Products Co. (1897-1977), and His Brothers-in-Law Max Albert of Galesburg Soy Products Co. (1893-1966) and Irving Rosen of Quincy Soybean Products Co. (1907-1964). 570, 942, 1061, 1199

Single Cell Proteins (Photosynthetic, Including Algae / Microalgae Such as Spirulina, Chlorella, and Scenedesmus). 717, 826

Single cell proteins. *See* Microbial Proteins (Non-Photosynthetic)

Sino-Japanese War (1894-1895)–Soybeans and Soyfoods. Rarely called Chinese-Japanese War. 313

Size of soybean seeds. *See* Seed Weight / Size (Soybeans)–Weight of 100 Seeds in Grams, or Number of Seeds Per Pound

Sizings for paper or textiles. *See* Paper Coatings or Sizings, or Textile Sizing

Smoked tofu. *See* Tofu, Smoked

Smoothies–Made with Soymilk, Tofu, Soy Yogurt, Soy Protein Isolate, Rice Milk, or Other Non-Dairy Smoothie Ingredients. Also spelled Smoothees. 845, 1223, 1658

Soaps or Detergents–Industrial Uses of Soy Oil as a Non-Drying Oil. 195, 235, 253, 283, 286, 296, 313, 321, 385, 407, 418, 549, 592

Societe Soy (Saint-Chamond, France). *See* Soyfoods Companies (Europe)–Nutrition et Soja

Society for Acclimatization *(Société d'Acclimatation,* France). 787

Soil Science. 95, 720

Soilage, soybean. *See* Feeds / Forage from Soybean Plants–Soilage and Soiling

Sojarei Vollwertkost GmbH (Traiskirchen, near Vienna, Austria). Formerly Sojarei Ebner-Prosl. 1027

Sojinal / Biosoja (Formerly Cacoja; Affiliate of Coopérative Agricole de Colmar–Issenheim & Colmar, France). Acquired by B & K Holdings, of Switzerland, in mid-1993. Acquired by Alpro (Belgium) on 22 April 1996. 1185, 1238

Solnuts B.V. (Tilburg, The Netherlands; and Hudson, Iowa). Including Edible Soy Products, makers of Pro-Nuts. Acquired by Specialty Food Ingredients Europe BV in Dec. 1991. Acquired by the Kerry Group in Jan. 2000 and Name Changed to Nutriant. 1626

Solomon Islands. *See* Oceania–Solomon Islands

Solvent extraction equipment. *See* Soybean Crushing–Equipment–Solvent extraction

Solvents–Ethanol (Ethyl Alcohol)–Used for Soy Oil Extraction, or Washing / Purification of Soy Products (Protein, Lecithin, Saponins, etc.). 881

Solvents–Hexane–Used Mainly for Soy Oil Extraction. 1047, 1626, 1659

Solvents Used for Extraction of the Oil from Soybeans (General, Type of Solvent, Unspecified, or Other). See also Ethanol, Hexane, and Trichloroethylene Solvents. 196, 253, 507

Solvents Used for Extraction of the Oil from Soybeans: Benzene / Benzine / Benzol / Benzin. 122, 132

Solvents, industrial. *See* Release or Curing Agents for Concrete or Asphalt, Industrial Solvents, Hydraulic Fluids, and Other Minor or General Uses

Solvents. *See* Soybean Crushing–Solvents

Soup, miso. *See* Miso Soup

Sour cream. *See* Dairylike Non-dairy Soy-based Products

South Africa. *See* Africa–South Africa

South America. *See* Latin America–South America

South Manchuria Railway and the South Manchuria Railway Company *(Minami Manshu Tetsudo Kabushiki Kaisha)*. 202, 203, 332, 405

South River Miso Co. (Conway, Massachusetts). Including Ohio Miso Co. 1604

Soy Cheese–Fermented, Western Style, That Melts. May Contain Casein (Cow's Milk Protein). 1242

Soy Cheese–Non-Fermented, Western Style, That Melts. Typically Made with Tofu or Isolated Soy Proteins. Usually Contains Casein (A Protein from Cow's Milk). 1242

Soy Cheese Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 889

Soy Cheese or Cheese Alternatives–General, Western Style, That Melts. Often Contains Casein (Cow's Milk Protein). 1302, 1386, 1537

Soy Cheesecake or Cream Pie, Usually Made with Tofu. 845, 962, 1149, 1348, 1349

Soy Chocolate (Toasted Soy Flour) (Also includes use of non-roasted Soy Flour or Soymilk in Making Chocolate). 273, 406, 430

Soy Coffee (Roasted Soy Flour)–Etymology of This Term and Its Cognates / Relatives in Various Languages. 273

Soy Coffee–Made from Roasted Soy Flour or Ground Roasted Soybeans. 82, 137, 152, 200, 256, 258, 273, 283, 312, 321, 385, 400, 406, 407, 423, 430, 434, 541, 763, 822, 1386, 1387

Soy Cream Cheese, Usually Made of Tofu or Soy Yogurt. 1642

Soy Flour–Whole or Full-fat. 347, 402, 439, 500, 508, 516, 533, 566, 584, 725, 763, 799, 826, 841, 880, 888, 923, 989, 1007, 1037, 1059, 1108, 1331, 1363, 1388, 1389, 1390

Soy Flour Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 559, 880, 989

Soy Flour Industry and Market Statistics, Trends, and Analyses–Individual Companies or Products. 506

Soy Flour or Defatted Soybean Meal in Cereal-Soy Blends, with Emphasis on Dry Products Used in Third World Countries. 368, 381, 409, 410, 436, 559, 713, 729, 760, 763, 822, 989

Soy Flour, Defatted or Partially Defatted, Used as an Ingredient in Second Generation Commercial Products Such as Baked Goods, Pasta, etc. 614, 1285, 1329, 1337

Soy Flour, Grits and Flakes (Usually Defatted)–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 989

Soy Flour, Grits, Meal, Powder, or Flakes–For Food Use (Usually Defatted or Low-Fat). See also Soy Flour–Whole or Full-fat. 158, 235, 273, 283, 292, 310, 312, 321, 377, 383, 385, 386, 394, 395, 402, 403, 407, 422, 424, 430, 440, 442, 443, 461, 462, 465, 472, 473, 481, 496, 502, 506, 515, 525, 565, 582, 583, 592, 609, 615, 617, 640, 642, 671, 698, 700, 710, 749, 763, 773, 791, 811, 818, 821, 822, 831, 850, 852, 857, 868, 879, 881, 974, 989, 996, 1032, 1050, 1080, 1098, 1122, 1125, 1180, 1206, 1251, 1305, 1306, 1307, 1319, 1336, 1342, 1369, 1375, 1385, 1386, 1387, 1412, 1447, 1461, 1464, 1478, 1517, 1537, 1547, 1559, 1560, 1564, 1573, 1642, 1649

Soy Flour, Grits, and Flakes–Enzyme Active (Whole / Full-Fat, Unheated). 500, 725, 880, 888, 1007, 1363, 1560

Soy Flour, Textured (Including TVP, Textured Vegetable Protein). 603, 631, 677, 698, 707, 794, 809, 810, 821, 868, 877, 879, 922, 1180, 1208, 1224, 1260, 1626

Soy Flour, Whole or Full-fat, Used as an Ingredient in Second Generation Commercial Products Such as Baked Goods, Pasta, etc. 368

Soy Ice Cream (General–Usually Non-Dairy). 845, 888, 913, 1016, 1044, 1046, 1047, 1048, 1058, 1089, 1093, 1094, 1099, 1100, 1112, 1119, 1130, 1134, 1139, 1148, 1149, 1157, 1172, 1238, 1278, 1281, 1317, 1343, 1346, 1508, 1513, 1523, 1537, 1598, 1607, 1642, 1670

Soy Ice Cream–Etymology of This Term and Its Cognates / Relatives in Various Languages. 1048

Soy Ice Cream–Non-Soy Non-Dairy Relatives (As Made from Amazake, Fruit Juices, Peanuts, Field Peas, etc.). 410, 1048

Soy Ice Cream Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1048, 1094

Soy Ice Cream Industry and Market Statistics, Trends, and Analyses–Individual Companies. 1048, 1112, 1148, 1149, 1157, 1172

Soy Molasses or Soy Solubles–A By-Product of Making Soy Protein Concentrate Using the Aqueous Alcohol Wash Process. Rich in Isoflavones. 1602

Soy Nugget Extract *(Shizhi / Shih Chih)*, and Soy Nugget Sauce (Mandarin: Shiyou / Shih-yu. Cantonese: Shi-yau / Si-yau / Seow. Japanese: Kuki-jiru). See also Black Bean Sauce. 1014

Soy Nuggets–Whole Soybeans Fermented with Salt–Also called Fermented Black Beans, Salted Black Beans, Salty Black Beans, Black Fermented Beans, Black Beans, Black Bean Sauce, Black Bean and Ginger Sauce, Chinese Black Beans, or Preserved Black Beans. In China (Mandarin): Shi, Doushi, or Douchi (pinyin), Tou-shih, Toushih, or Tou-ch'ih (Wade-Giles). Cantonese: Dow see, Dow si, Dow-si, Dowsi, or Do shih. In the Philippines: Tausi or Taosi / Tao-si. In Malaysia or Thailand: Tao si. In Indonesia: Tao dji, Tao-dji, or Tao-djie. In Japan: Hamanatto, Daitokuji Natto, Shiokara Natto, and Tera Natto. 93, 307, 321, 385, 402, 632, 763, 1014, 1445

Soy Oil–Etymology of This Term and Its Cognates / Relatives in Various Languages. 64, 418, 854, 953

Soy Oil Constants–Iodine Number / Value. 122, 132, 346, 854

Soy Oil Constants. Includes Index of Refreaction, Refreactive Index, Solidification Point *(Erstarrungspunkt)*, Specific Gravity. See also Iodine Number. 346

Soy Oil as a Commodity, Product, or Ingredient for Food Use (in Cookery or Foods). Its Manufacture, Refining, Trade, and Use. See Also: Industrial Uses of Soy Oil, and Nutrition: Lipids. 64, 81, 95, 107, 122, 132, 133, 137, 210, 222, 226, 235, 241, 253, 256, 258, 261, 262, 273, 282, 283, 296, 305, 307, 308, 310, 312, 313, 320, 321, 325, 332, 346, 347, 350, 395, 402, 403, 406, 407, 418, 430, 431, 464, 473, 497, 538, 549, 563, 565, 576, 579, 583, 586, 592, 608, 620, 713, 729, 737, 758, 760, 839, 857, 867, 868, 929, 942, 953, 957, 1061, 1078, 1080, 1147, 1151, 1158, 1161, 1200, 1559, 1679

Soy Plant (The) (Ann Arbor, Michigan). *See* Tofu International Ltd.

Soy Products of Australia Pty. Ltd. (Bayswater, Victoria, Australia). Formerly F.G. Roberts Health Food Products (Melbourne). 342, 344, 349, 356, 359, 361, 362, 366, 368, 371, 375, 376, 377, 381, 382, 383, 389, 390, 391, 392, 393, 396, 398, 399, 400, 401, 407, 409, 410, 411, 412, 415, 417, 421, 423, 424, 425, 432, 433, 434, 435, 436, 437, 439, 440, 446, 450, 472, 481, 498, 500, 505, 508, 516, 539, 566, 584, 614, 615, 710, 725, 776, 801, 888, 923, 1007, 1059, 1108, 1304, 1305, 1306, 1307, 1329, 1337, 1363, 1374, 1375, 1380, 1385, 1386, 1387, 1388, 1389, 1390, 1392, 1394, 1397, 1696, 1697, 1698, 1704

Soy Protein Council (Food Protein Council from 1971 to Dec. 1981). 717

Soy Protein Isolates, Concentrates, or Textured Soy Protein Products–Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 642, 1180, 1208, 1302

Soy Protein Isolates, Concentrates, or Textured Soy Protein Products–Industry and Market Statistics, Trends, and Analyses–

Individual Companies. 698, 879, 1050, 1230, 1508, 1550, 1578, 1623

Soy Protein Isolates, Textured (For Food Use Only, Including Spun Soy Protein Fibers or Soy Isolate Gels). See also: Industrial Uses of Soy Proteins–Fibers (Artificial Wool Made from Spun Soy Protein Fibers). 642, 658, 697, 698, 1047, 1559

Soy Protein Products (General, or Modern Products). See also: Nutrition–Protein, Protein Quality, and Amino Acid Composition. 698, 717, 794, 1205, 1274, 1464, 1679

Soy Protein and Proteins–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 74

Soy Proteins–Concentrates. 642, 749, 881, 974, 996, 1003, 1180, 1336, 1342, 1463, 1559, 1602, 1626

Soy Proteins–Hydrolyzed and Hydrolysates (General), as in Flavourings, HVP, Cosmetics, Personal Care Products, Predigested Milk Replacers, etc. 1135

Soy Proteins–Isolates–Enzyme-Modified Soy Protein with Whipping / Foaming Properties Used to Replace Egg Albumen, and Early Related Whipping / Aerating Agents or Products. 1050

Soy Proteins–Isolates, for Food Use. See also: Isolates, for Industrial (Non-Food) Use. 321, 515, 609, 642, 678, 733, 818, 820, 863, 881, 974, 991, 996, 1044, 1045, 1048, 1050, 1090, 1098, 1112, 1137, 1180, 1198, 1221, 1235, 1241, 1242, 1254, 1265, 1271, 1302, 1319, 1325, 1336, 1342, 1357, 1370, 1382, 1409, 1439, 1449, 1463, 1470, 1508, 1509, 1516, 1550, 1552, 1556, 1560, 1561, 1578, 1588, 1590, 1598, 1615, 1623, 1626, 1659, 1691

Soy Proteins–Isolates, for Industrial (Non-Food) Use. See also: Isolates, for Food Use. 385, 1180, 1302

Soy Proteins–Properties (Including Types [Globulins, Glycinin, Beta- and Gamma-Conglycinin] Protein Fractions and Subunits, Sedimentation Coefficients, Nitrogen Solubility, and Rheology). 74, 765, 856, 866, 1559

Soy Proteins–Used as an Ingredient in or for Early Second Generation Commercial Food or Beverage Products. 631

Soy Proteins, Textured (General). 642, 677, 697, 754, 759, 795, 997, 1035, 1141, 1464

Soy Puddings, Custards, Parfaits, or Mousses (Usually made from Soymilk or Tofu). See also Soy Yogurt–Not Fermented. 347, 963, 1048, 1144

Soy Sauce (Including Shoyu and Worcestershire Sauce)–Imports, Exports, International Trade. 9, 18, 87, 108, 119, 169, 175, 217, 218, 256, 323, 683, 730, 938, 972, 1152, 1159, 1201, 1272

Soy Sauce (Including Shoyu). See Also Tamari, Teriyaki Sauce, and Traditional Worcestershire Sauce. 3, 7, 8, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 21, 22, 23, 24, 26, 29, 30, 31, 33, 34, 35, 37, 38, 40, 42, 46, 48, 49, 50, 51, 61, 63, 64, 65, 66, 72, 73, 74, 76, 90, 91, 95, 96, 102, 106, 107, 108, 119, 120, 125, 130, 134, 157, 162, 169, 173, 175, 176, 177, 178, 180, 184, 189, 197, 217, 218, 235, 256, 258, 273, 283, 301, 307, 310, 312, 317, 321, 323, 328, 329, 330, 334, 347, 348, 354, 380, 384, 385, 395, 402, 406, 413, 416, 430, 441, 454, 458, 459, 485, 497, 510, 592, 632, 662, 683, 719, 730, 763, 764, 788, 817, 821, 822, 826, 841, 885, 938, 971, 972, 988, 1014, 1037, 1062, 1080, 1084, 1088, 1089, 1130, 1152, 1159, 1163, 1191, 1201, 1272, 1294, 1390, 1430, 1455, 1488, 1514, 1537, 1555, 1559, 1560, 1575, 1597, 1599, 1617, 1626, 1638, 1642, 1663, 1667, 1680, 1711

Soy Sauce–Saishikomi Shoyu (Twice-Brewed). 1599

Soy Sauce Companies (Asia)–Important Japanese Shoyu Manufacturers Other Than Kikkoman and Yamasa–Higashimaru, Higeta, Marukin, Choshi. 1014

Soy Sauce Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 323, 380, 497, 763, 1014, 1201, 1597, 1617

Soy Sauce Industry and Market Statistics, Trends, and Analyses–Individual Companies. 217, 218, 323, 348, 938, 1014, 1201, 1514, 1555, 1597, 1617

Soy Sauce and Shoyu–Etymology of These Terms and Their Cognates / Relatives in Various Languages. 102, 1014

Soy Sauce, Clear *(Shiro Shoyu).* Made in the Mikawa region of Central Japan near Nagoya. 1599

Soy Sauce, HVP Type (Non-Fermented or Semi-Fermented, Made with Acid-Hydrolyzed Vegetable Protein; an Amino Acid Seasoning Solution Rich in Glutamic Acid). Also Called Pejoratively Chemical Soy Sauce. 698

Soy Sauce, Indonesian Style or from the Dutch East Indies (Kecap, Kécap, Kechap, Ketjap, Kétjap). See also Ketchup / Catsup. 4, 5, 6, 102, 385, 406, 632, 648, 763, 788, 817, 822, 826, 1014, 1642, 1711

Soy Sauce, Used as an Ingredient in Commercial Products. 557, 659, 708, 709, 978, 1004, 1075, 1159, 1233

Soy Sprouts (Sprouted or Germinated Soybeans) for Food Use. 131, 136, 307, 310, 312, 321, 386, 402, 403, 430, 473, 541, 640, 662, 763, 821, 822, 826, 1080, 1168, 1188, 1192, 1540, 1560, 1642

Soy Yogurt (Generally Non-Dairy). 889, 992, 1144, 1184, 1231, 1278, 1281, 1537, 1561, 1591, 1598, 1607

Soy Yogurt–Fermented / Cultured. 973, 1185, 1223, 1335, 1368, 1430, 1451, 1458, 1674, 1687

Soy bran. *See* Fiber, Soy

Soy fiber. *See* Fiber

Soy flour companies (Europe). *See* Spillers Premier Products Ltd. (Puckeridge, Ware, Hertfordshire, England)

Soy flour companies (Oceania). *See* Soy Products of Australia Pty. Ltd

Soy ice cream companies (USA). *See* Barricini Foods (Mountain Lakes, New Jersey), Tofutti Brands, Inc. (Cranford, New Jersey)

Soy infant formula. *See* Infant Formula, Soy-based

Soy lecithin. *See* Lecithin, Soy

Soy oil–industry and market statistics. *See* Soybean Crushing

Soy protein companies (USA). *See* Borden, Inc., Delsoy Products, Inc., Drackett Co. (The), Glidden Co. (The), Griffith Laboratories, Gunther Products, Inc., Laucks (I.F.) Co., Protein Technologies International (PTI), Rich Products Corporation

Soy sauce–Korean-style. *See* Kanjang–Korean-Style Fermented Soy Sauce

Soy sauce companies (Asia & USA). *See* San Jirushi Corp., and San-J International (Kuwana, Japan; and Richmond, Virginia), Yamasa Corporation (Choshi, Japan; and Salem, Oregon)

Soy sauce companies (international). *See* Kikkoman Corporation (Tokyo, Walworth, Wisconsin; and Worldwide)

Soy sauce companies or brands (USA). *See* La Choy

Soy sauce residue or dregs. *See* Fiber–Residue or Dregs from Making Soy Sauce

Soy sauce served in cruets with cruet frames. *See* Cruets (Glass Bottles)

Soy sauce used in Worcestershire sauce. *See* Worcestershire Sauce–With Soy Sauce Used as an Ingredient

Soy sauce. *See* Tamari, Teriyaki Sauce and Teriyaki (Soy Sauce is the Main Sauce Ingredient), Worcestershire Sauce

Soy whip topping. *See* Whip Topping

Soy wine. *See* Fermented Specialty Soyfoods

Soy, etymology of the word. *See* Etymology of the Word "Soy" and its Cognates / Relatives in English

Soya–Soybean Production and Soy Products. 261, 486, 531

Soya Foods Ltd [Named Soya Flour Manufacturing Co. Ltd. (1929-42), and Soya Foods Ltd. (1933)]. *See* Spillers Premier Products Ltd.

Soya Health Foods Ltd. (Manchester, England). Including Michael Cole and his Soya International Ltd. 1119, 1150, 1430

Soya Kaas Inc. *See* Swan Gardens Inc. and Soya Kaas Inc.

SoyaWax International (Cedar Rapids, Iowa), Michael Richards, and Heartland Candleworks Inc. 1671

SoyaWorld Inc. *See* ProSoya

SoyaWorld, Inc. (Near Vancouver, British Columbia, Canada). Started 1997. Acquired in 2002 by Sanitarium Foods of Australia. 1516, 1556, 1561, 1588, 1590, 1591, 1598, 1626, 1627, 1644, 1650, 1679, 1681, 1691, 1692

Soyana (Zurich, Switzerland). 948, 1000, 1027, 1238

Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH (Dorsten, Germany). Acquired by Huegli in April 1991. 1027, 1231, 1236, 1241

Soyatech (Publisher of Soya Bluebook and Soya Newsletter, Bar Harbor, Maine. Note: In March 1980 Peter Golbitz and Sharyn Kingma started Island Tofu Works, a tofu manufacturing company, in Bar Harbor, Maine). 857, 1170, 1296, 1424, 1463, 1560

Soybean–General Comprehensive and Basic Important Publications about Soybeans. 321

Soybean–General and Other. 1080

Soybean–Growth Regulators / Substances Such as Triiodobenzoic Acid (TIBA), Gibberellic Acid, Gibberellins, Auxins, Cytokinins, Dicamba, and Florigen. 634, 670, 1168, 1192

Soybean–Morphology, Structure, and Anatomy of the Plant and Its Seeds as Determined by Microscopy or Microscopic Examination. 721

Soybean–Morphology, Structure, and Anatomy of the Plant and Its Seeds. 64, 168, 175, 321, 758, 930, 1200

Soybean–Physiology–Photoperiodism / Photoperiod, Photoperiodic Effects, or Photo-Thermal Responses. 571, 610, 634, 675, 740, 746, 758, 896, 1085

Soybean–Physiology and Biochemistry (Including Photoperiodism, Photosynthesis, Translocation, Plant Water Relations, Respiration, Photorespiration). 172, 387, 535, 548, 552, 567, 573, 574, 585, 726, 768, 772, 868, 904, 985, 1124, 1126

Soybean–Physiology and Biochemistry–Maturity Groups. 661, 738, 747

Soybean–Taxonomy / Classification. 2, 19, 44, 52, 56, 60, 62, 64, 94, 95, 103, 166, 321, 367, 372, 553, 569, 789, 796, 930, 931, 985, 1060, 1200, 1220, 1312

Soybean–origin and domestication. *See* Origin, Domestication, and Dissemination of the Soybean (General)

Soybean Council of America. *See* American Soybean Association (ASA)–Soybean Council of America

Soybean Crushers (Europe). *See* Unilever Corp., Lever Brothers Co., Unimills B.V. (Netherlands)

Soybean Crushers (USA), Early–Pacific Oil Mills and Albers Brothers Milling Co. (Seattle, Washington; 1911), Elizabeth City Oil and Fertilizer Co. (Elizabeth City, North Carolina; 1915. By 1917 six other North Carolina oil mills were crushing soybeans), Chicago Heights Oil Mfg. Co. (Chicago Heights, Illinois; 1920), A.E. Staley Mfg. Co. (Decatur, Illinois; 1922), Piatt County Cooperative Soy Bean Co. (Monticello, Illinois; 1923–batch solvent), Blish Milling Co. (Seymour and Crothersville, Indiana; 1923), Eastern Cotton Oil Co. (Norfolk, Virginia; 1924–continuous solvent). 296

Soybean Crushers (USA). *See* Seed Companies, Soybean–Funk Brothers Seed Co. (Bloomington, Illinois)–After 1924, Sinaiko Family and Iowa Milling Co. (Cedar Rapids, Iowa)

Soybean Crushing (General: Soy / Soybean Oil and Soybean Meal). 467, 507, 582, 588, 599, 645, 866, 1047, 1578

Soybean Crushing–Equipment–Hydraulic Presses. 122, 132, 403

Soybean Crushing–Equipment–Screw Presses and Expellers (Continuous, Mechanical). 942

Soybean Crushing–Equipment–Solvent Extraction. 1047

Soybean Crushing–Equipment–Wedge Presses (Early Technology from China and Manchuria). 122, 132

Soybean Crushing, Including Production and Trade of Soybean Oil, Meal or Cake, Margarine, or Shortening–Industry and Market Statistics, Trends, and Analyses -. 313, 321, 325, 350, 418, 473, 839, 857, 942, 1061, 1098, 1143, 1180, 1199

Soybean Cultural Practices–No-Till, Conservation Tillage, and Minimum Tillage Farming / Agriculture. 981, 1507

Soybean Meal (SBM) (Defatted). Formerly Called Bean Cake, Beancake, Soybean Cake, Oilmeal, or Presscake. 81, 95, 117, 147, 170, 188, 196, 209, 225, 226, 235, 246, 256, 258, 261, 285, 286, 296, 304, 307, 312, 321, 331, 332, 347, 350, 385, 406, 407, 474, 497, 549, 550, 592, 606, 620, 677, 717, 719, 839, 865, 942, 957, 1040, 1080, 1091, 1116, 1151, 1199, 1207, 1291, 1341, 1514, 1527, 1546, 1560

Soybean Meal / Cake, Fiber (as from Okara), or Shoyu Presscake as a Fertilizer or Manure for the Soil–Industrial Uses. 59, 76, 81, 188, 196, 283, 291, 296, 307, 312, 321, 347, 350, 385, 406

Soybean Production–General, and Amount Produced. 92, 104, 111, 148, 175, 233, 241, 250, 254, 255, 297, 306, 310, 320, 322, 347, 352, 364, 406, 414, 418, 427, 429, 439, 444, 451, 452, 456, 457, 460, 463, 464, 474, 481, 491, 492, 507, 517, 555, 564, 580, 581, 582, 595, 597, 598, 600, 612, 616, 619, 623, 625, 638, 644, 646, 654, 667, 728, 741, 766, 780, 826, 837, 857, 862, 868, 870, 917, 926, 928, 939, 1017, 1067, 1083, 1126, 1151, 1211, 1392

Soybean Production–Industry and Market Statistics, Trends, and Analyses. 857, 1167, 1207, 1291, 1424, 1560

Soybean Rust (Fungal Disease). 115, 248, 340, 594, 701, 703, 704, 711, 739, 740, 753, 757, 769, 774, 807, 808, 819, 823, 829, 832, 834, 840, 843, 847, 860, 861, 874, 915, 919, 920, 985, 1280, 1312, 1321, 1429, 1666, 1669

Soybean Seeds–Black in Color. Food Use is Not Mentioned. 115, 224, 226, 243, 256, 258, 269, 285, 295, 296, 303, 311, 321, 373, 374, 380, 428, 452, 457, 467, 473, 482, 538, 562, 579, 580, 618, 628, 636, 639, 661, 674, 690, 758, 873, 1179, 1190, 1286

Soybean Seeds–Black in Color. Used as Food (Including in Soy Nuggets and Inyu), Beverage, Feed, or Medicine, or Their Nutritional Value. 307, 496, 632, 662, 788, 955

Soybean Seeds–Brown in Color. Especially Early Records. 246, 256, 261, 269, 295, 311, 373, 418, 428, 467, 482, 496, 1179

Soybean Seeds–Green in Color. Food Use is Not Mentioned. Early Named Varieties Include Aoda, Columbia, Giant Green, Guelph or Medium Green, Medium Early Green, Medium Green, Samarow, Sonoma, and Tashing. 196, 256, 261, 269, 285, 303, 311, 428, 467, 482, 496, 1179

Soybean Seeds–Mottled, Speckled, Spotted, Striped, Banded, Flecked, Variegated, or Bicolored. 256, 311, 496

Soybean Seeds–Red in Color. 243

Soybean Seeds–White in Color. 115, 256, 307

Soybean Seeds–Yellow in Color. Including Yellowish White, Cream Colored, and Pale *(Pallida)*. Especially Early Records. See also: Soybean Seeds–White. 95, 243, 256, 261, 269, 285, 296, 303, 379, 408, 418, 426, 428, 467, 482, 496, 538, 1286

Soybean Varieties Canada–Harosoy. 536, 621

Soybean Varieties Canada–O.A.C. 211–Early Development. 418, 467, 482

Soybean Varieties Canada–O.A.C. No. 81–Early Development. 467

Soybean Varieties Europe–Gelbe Riesen ("Yellow Giant" / Giant Yellow)–Early Introduction. 285, 1179

Soybean Varieties USA–A.K.–Early Introduction. 418, 457, 1286

Soybean Varieties USA–Acme–Early Introduction. 1179

Soybean Varieties USA–Agate–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Aksarben–Early Introduction. 374, 428, 467

Soybean Varieties USA–American Coffee Berry–Early Introduction. Renamed Ito-San by about 1902. 467

Soybean Varieties USA–Amherst–Early Introduction. 467, 1179

Soybean Varieties USA–Aoda–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Arlington–Early Introduction. 285

Soybean Varieties USA–Auburn–Early Selection (1907). 295, 418, 1179

Soybean Varieties USA–Baird–Early Introduction. 241, 246, 261, 1179

Soybean Varieties USA–Bansei–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Barchet–Early Introduction. 296, 428

Soybean Varieties USA–Biloxi–Early Introduction. 296, 379, 380, 418, 428, 452, 567, 571, 572, 634, 1179, 1190, 1286

Soybean Varieties USA–Black Eyebrow–Early Introduction. 296, 374, 418, 428, 467

Soybean Varieties USA–Brindle–Early Introduction. 1179

Soybean Varieties USA–Brooks–Early Introduction. 1179

Soybean Varieties USA–Brownie–Early Introduction. 241, 261, 285, 1179

Soybean Varieties USA–Buckshot–Early Introduction. 321, 482, 1179

Soybean Varieties USA–Butterball–Early Introduction. 321, 1179

Soybean Varieties USA–Chame–Large-Seeded and / or Vegetable-Type. 428, 1179

Soybean Varieties USA–Chernie–Early Introduction. 418, 428, 467, 1179

Soybean Varieties USA–Chestnut–Early Selection (1907). 428, 467

Soybean Varieties USA–Chiquita–Early Introduction. 296, 428, 1179

Soybean Varieties USA–Chusei–Large-Seeded and / or Vegetable-Type. 428, 467

Soybean Varieties USA–Cloud–Early Introduction. 467

Soybean Varieties USA–Columbia / Columbian–Early Introduction. 428, 1190

Soybean Varieties USA–Duggar–Early Introduction. 1179

Soybean Varieties USA–Dunfield–Early Introduction. 374, 428, 468, 469, 473, 501, 1286

Soybean Varieties USA–Early Black–Early Introduction. Renamed Buckshot by May 1907. 467

Soybean Varieties USA–Early Brown–Early Introduction. 295, 418, 467, 482, 1179

Soybean Varieties USA–Early Green–Early Introduction. 428

Soybean Varieties USA–Early Yellow–Early Introduction. Renamed Ito San by about 1902. 171, 285, 408, 418, 428, 467

Soybean Varieties USA–Easycook / Easy Cook–Early Introduction. Large-Seeded and/or Vegetable-Type. 428, 457, 467, 473

Soybean Varieties USA–Ebony–Early Introduction. 295, 418, 428, 467

Soybean Varieties USA–Eda–Early Introduction. 321, 1179

Soybean Varieties USA–Edna–Early Introduction. 1179

Soybean Varieties USA–Edward–Early Introduction. 1179

Soybean Varieties USA–Elton–Early Introduction. 374, 428, 467

Soybean Varieties USA–Etum or Eatum–Large-Seeded and / or Vegetable-Type. 482

Soybean Varieties USA–Fairchild–Early Introduction. 1179

Soybean Varieties USA–Farnham–Early Introduction. 1179

Soybean Varieties USA–Flat King–Early Introduction. 1179

Soybean Varieties USA–Flava–Early Selection (1907). 1179

Soybean Varieties USA–Fuji–Large-Seeded and / or Vegetable-Type. 428

Soybean Varieties USA–Funk Delicious–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Goku–Large-Seeded and / or Vegetable-Type. 428

Soybean Varieties USA–Green–Early Introduction. 467

Soybean Varieties USA–Green Samarow–Early Introduction. Renamed Samarow in 1907. 285

Soybean Varieties USA–Guelph–Early Introduction. 228, 261, 296, 321, 428, 482

Soybean Varieties USA–Habaro–Early Introduction. Also spelled "Habara" in Canada. 374, 428, 467

Soybean Varieties USA–Haberlandt–Early Introduction. 296, 316, 318, 320, 428, 457, 467, 473, 482, 1286

Soybean Varieties USA–Hahto–Early Introduction. Large-Seeded and / or Vegetable-Type. 428, 467

Soybean Varieties USA–Hakote–Large-Seeded and / or Vegetable-Type. 428

Soybean Varieties USA–Hamilton–Early Introduction. 482, 1179

Soybean Varieties USA–Hankow–Early Introduction. 1179

Soybean Varieties USA–Hansen–Early Introduction. 1179

Soybean Varieties USA–Higan–Large-Seeded and / or Vegetable-Type. 428, 467, 1286

Soybean Varieties USA–Hiro–Large-Seeded and / or Vegetable-Type. 428, 1179

Soybean Varieties USA–Hokkaido–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Hollybrook–Early Introduction. 295, 296, 418, 428, 482

Soybean Varieties USA–Hongkong / Hong Kong–Early Introduction. 428

Soybean Varieties USA–Hoosier–Early Introduction. 428

Soybean Varieties USA–Hope–Early Selection (1905). 1179

Soybean Varieties USA–Hurrelbrink–Early Introduction. 428

Soybean Varieties USA–Imperial–Large-Seeded and / or Vegetable-Type. 428

Soybean Varieties USA–Indiana Hollybrook–Early Development. 428

Soybean Varieties USA–Ito San–Early Introduction. Synonyms–Medium Early Yellow, Early White, Early Yellow, Kaiyuski Daizu, Kiyusuki Daidzu, Kysuki, Yellow Eda Mame, Dwarf Early Yellow, Early, Eda Mame, Coffee Berry. 241, 246, 261, 295, 296, 321, 374, 428, 457, 467, 482, 1179

Soybean Varieties USA–Jet–Early Introduction. 467, 1179

Soybean Varieties USA–Jogun–Large-Seeded and / or Vegetable-Type. 428, 467, 496

Soybean Varieties USA–Kailua–Large-Seeded and / or Vegetable-Type. 737

Soybean Varieties USA–Kanro–Large-Seeded and / or Vegetable-Type. 428, 467, 496, 1286

Soybean Varieties USA–Kentucky A–Early Selection. 1179

Soybean Varieties USA–Kingston–Early Introduction. 321, 373

Soybean Varieties USA–Kura–Large-Seeded and / or Vegetable-Type. 428, 467

Soybean Varieties USA–Laredo–Early Introduction. 374, 418, 428, 1286

Soybean Varieties USA–Lexington–Early Introduction. 296, 428

Soybean Varieties USA–Lowrie–Early Selection (1908). 1179

Soybean Varieties USA–Mammoth–Early Introduction. 296, 321, 482, 538

Soybean Varieties USA–Mammoth Brown–Early Introduction. 428, 467, 482, 1179

Soybean Varieties USA–Mammoth Yellow–Early Introduction. 296, 379, 418, 426, 428, 482, 1286

Soybean Varieties USA–Manchu–Early Introduction. 296, 374, 408, 418, 428, 467, 482, 1286

Soybean Varieties USA–Manchuria–Early Introduction. 482

Soybean Varieties USA–Mandarin–Early Introduction. 374, 408, 418, 428, 467, 482, 1190, 1286

Soybean Varieties USA–Manhattan–Early Introduction. 482, 1179

Soybean Varieties USA–Medium Black–Early Introduction. Renamed Buckshot by 1948. 482

Soybean Varieties USA–Medium Early Black–Early Introduction. Renamed Buckshot by 1907. 467, 482

Soybean Varieties USA–Medium Early Yellow–Early Introduction. 467

Soybean Varieties USA–Medium Green–Early Introduction. 321, 428, 467, 482

Soybean Varieties USA–Medium Yellow–Early Selection (1905). Renamed Midwest by 1923. 296, 428, 482, 538

Soybean Varieties USA–Mendota–Large-Seeded and / or Vegetable-Type. 482, 496

Soybean Varieties USA–Merko–Early Introduction. 482, 1179

Soybean Varieties USA–Meyer–Early Introduction. 285, 467, 482, 1179

Soybean Varieties USA–Midwest–Early Introduction. 428, 482

Soybean Varieties USA–Mikado–Early Development. 295, 418, 467, 482, 1179

Soybean Varieties USA–Minsoy–Early Introduction. 374, 428, 482

Soybean Varieties USA–Mongol–Early Introduction. 467, 482

Soybean Varieties USA–Morgan–Early Introduction. 482, 1179

Soybean Varieties USA–Morse–Early Introduction. 295, 418, 428, 482

Soybean Varieties USA–Nanda–Large-Seeded and / or Vegetable-Type. 428, 467, 482, 512, 517, 539, 558, 572

Soybean Varieties USA–Natsu–Early Introduction. 482, 1179

Soybean Varieties USA–Nemo–Early Introduction. 482, 1179

Soybean Varieties USA–Nielsen–Early Selection. 482, 1179

Soybean Varieties USA–Nigra–Early Introduction. 482, 1179

Soybean Varieties USA–Nuttall–Early Introduction. 467, 482, 1179

Soybean Varieties USA–Ogemaw / Ogema–Early Development. Synonym–Dwarf Brown (Morse 1948). 321, 373, 374, 418, 428, 482

Soybean Varieties USA–Ohio 9016–Early Introduction. 467

Soybean Varieties USA–Ohio 9035–Early Development. Renamed Hamilton by 1923. 467, 482

Soybean Varieties USA–Okute / O'kute / O'Kute–Early Introduction. 482, 1179

Soybean Varieties USA–Osaya–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Otootan / O-too-tan–Early Introduction. 316, 320, 343, 364, 370, 380, 428, 452, 457, 473, 482, 538, 539, 1179, 1286

Soybean Varieties USA–Peking / Pekin–Early Selection (1907). 295, 296, 418, 428, 452, 467, 482

Soybean Varieties USA–Perley's Mongol–Early Selection (1912). 482

Soybean Varieties USA–Pingsu–Early Introduction. 482, 1179

Soybean Varieties USA–Pinpu–Early Introduction. 428, 482

Soybean Varieties USA–Riceland–Early Introduction. 482, 1179

Soybean Varieties USA–Rokusun–Large-Seeded and / or Vegetable-Type. 428, 467, 482

Soybean Varieties USA–Sac–Large-Seeded and / or Vegetable-Type. 482, 496

Soybean Varieties USA–Samarow–Early Introduction. 285, 321, 482, 1179

Soybean Varieties USA–Sanga–Large-Seeded and / or Vegetable-Type. 482

Soybean Varieties USA–Saskatoon–Early Introduction. 482, 1179

Soybean Varieties USA–Sato–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Sedo–Early Introduction. 482, 1179

Soybean Varieties USA–Seminole–Large-Seeded and / or Vegetable-Type. 482, 496, 628

Soybean Varieties USA–Shanghai–Early Introduction. 296, 482

Soybean Varieties USA–Sherwood–Early Introduction. 467, 482, 1179

Soybean Varieties USA–Shingto–Early Introduction. 467, 482

Soybean Varieties USA–Shiro–Large-Seeded and / or Vegetable-Type. 428, 467, 482

Soybean Varieties USA–Sioux–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Sousei–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Southern Prolific–Early Introduction. 428, 482, 1179

Soybean Varieties USA–Soysota–Early Introduction. 374, 428, 482

Soybean Varieties USA–Stuart–Early Introduction. 482, 1179

Soybean Varieties USA–Suru–Large-Seeded and / or Vegetable-Type. 428, 482, 1179

Soybean Varieties USA–Swan–Early Introduction. 482, 1179

Soybean Varieties USA–Taha–Early Introduction. 467, 482, 1179

Soybean Varieties USA–Tarheel / Tar Heel / Tar-Heel–Early Introduction. Renamed Tarheel Black May 1915. 482

Soybean Varieties USA–Tarheel Black / Tar-Heel Black / Tar Heel Black–Early Introduction. 428, 482

Soybean Varieties USA–Tashing–Early Introduction. 295, 418, 482, 1179

Soybean Varieties USA–Tastee–Large-Seeded and / or Vegetable-Type. 482

Soybean Varieties USA–Toku–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Tokyo / Tokio–Early Introduction. 296, 379, 418, 428, 457, 482, 1286

Soybean Varieties USA–Trenton–Early Introduction. 482, 1179

Soybean Varieties USA–Vireo–Early Introduction. 482, 1179

Soybean Varieties USA–Virginia–Early Selection (1907). 296, 418, 428, 452, 467, 482

Soybean Varieties USA–Waseda–Large-Seeded and / or Vegetable-Type. 428, 482

Soybean Varieties USA–Wea–Early Introduction. 428, 482

Soybean Varieties USA–White Eyebrow–Early Introduction. 467, 482, 1179

Soybean Varieties USA–Willomi–Large-Seeded and / or Vegetable-Type. 428, 467, 482

Soybean Varieties USA–Wilson–Early Introduction. 296, 428, 467, 482, 628, 639

Soybean Varieties USA–Wilson-Five / Wilson Five / Wilson 5 / Wilson-5 / Wilson V–Early Selection (1912). 428, 482

Soybean Varieties USA–Wisconsin Black–Early Introduction. 418, 428, 467, 482

Soybean Varieties USA–Wolverine–Large-Seeded and / or Vegetable-Type. 482

Soybean Varieties USA–Yellow Marvel–Large-Seeded and / or Vegetable-Type. 482

Soybean Varieties USA–Yokoten / Yokotenn–Early Introduction. 428

Soybean Varieties USA–Yosho–Early Introduction. 482, 1179

Soybean archaeology. *See* Archaeology

Soybean crushers (Asia). *See* Ajinomoto Co. Inc. (Tokyo, Japan), Fuji Oil Co., Ltd. (Osaka, Japan), Incl. Fuji Purina Protein Ltd.

Soybean crushers (Europe). *See* Vandemoortele N.V. (Izegem, Netherlands)

Soybean crushers (USA), Cooperative. *See* Ag Processing Inc a cooperative (AGP), Far-Mar-Co, Inc., Farmers Union Grain Terminal Association (GTA), Honeymead (Mankato, Minnesota), Land O'Lakes, Inc.

Soybean crushers (USA). *See* Allied Mills, Inc., Archer Daniels Midland Co. (ADM) (Decatur, Illinois), Bunge Corp. (White Plains, New York), Cargill, Inc. (Minneapolis, Minneapolis), Central Soya Co. (Fort Wayne, Indiana), Continental Grain Co. (New York, New York), Honeymead Products Co., Procter & Gamble Co. (Cincinnati, Ohio). Including the Buckeye Cotton Oil Co., Quincy Soybean Products Co. (Quincy, Illinois), Ralston Purina Co. (St. Louis, Missouri), Spencer Kellogg & Sons, Inc. (Buffalo, New York), Staley (A.E.) Manufacturing Co. (Decatur,, Swift & Co. (Illinois)

Soybean crushing–solvents. *See* Solvents

Soybean meal pellets. *See* Pellets Made from Soybean Meal

Soybean oil constants. *See* Soy Oil Constants

Soybean oil. *See* Soy Oil

Soybean paste. *See* Miso

Soybean pellets. *See* Pellets Made from Soybean Meal

Soybean processing. *See* Soybean Crushing

Soybean production–Farm Machinery. *See* Tractors

Soybean production–Farm equipment. *See* Machinery (Agricultural), Implements, Equipment, and Mechanization

Soybean production–Farm machinery. *See* Combines, Combines–Etymology

Soybean production–Marketing. *See* Marketing Soybeans

Soybean production–Nitrogen Fixation and Inoculation. *See* Nitragin Inoculant Company

Soybean production–Plant protection. *See* Diseases (Bacterial, Fungal, and Viral / Virus), Insects–Pest Control. See also: Integrated Pest Management, Integrated Pest Management (IPM) and Biological Control, Nematodes–Disease Control, Pesticides (General), Weeds–Control and Herbicide Use

Soybean production–Research. *See* Research on Soybeans

Soybean production in tropical and subtropical countries. *See* Tropical and Subtropical Countries, Soybean Production in (Mostly in

Soybean production, organic. *See* Organic Soybean Production

Soybean production. *See*–Fertilizers and Plant Nutrition, Cover Crop, Use of Soybean as. See also: Intercropping, Crop Rotation of Soybean Plants for Soil Improvement, Cropping Systems: Intercropping, Interplanting, or Mixed Cropping, Cultural Practices, Green Manure, Harvesting and Threshing, Identity Preserved / Preservation, Organically Grown Soybeans, Plant Protection from Diseases, Pests and Other Types of Injury (General), Policies and Programs, Government, Prices of

Soybeans, Soybean Products, and Soybean Seeds, Seed Germination or Viability–Not Including Soy Sprouts, Seed Quality, Soil Science, Storage of Seeds, Yield Statistics, Soybean

Soybeans, black. *See* Whole Dry Soybeans–Black Seeded

Soybeans, ground (used as food). *See* Whole Dry Soybeans

Soybeans, whole dry (used unprocessed as food). *See* Whole Dry Soybeans

Soybeans, wild. *See* Wild Soybeans (General)

Soyfood products, commercial. *See* Commercial Soy Products–New Products

Soyfoods (General Food Uses of Soybeans). 235, 445, 534, 592, 1098, 1143, 1165, 1195, 1211, 1575, 1642

Soyfoods Association of North America (SANA). Founded 29 June 1978. 800

Soyfoods Associations in Europe. 1130, 1138, 1236, 1241

Soyfoods Center. *See* Soyinfo Center (Lafayette, California)

Soyfoods Industry and Market Statistics, Trends, and Analyses–By Geographical Region. Includes per capita consumption of soybeans. 857, 1237, 1296

Soyfoods Industry and Market Statistics, Trends, and Analyses–Individual Companies. 759, 967

Soyfoods Movement–Periodicals, Including Soycraft, Soyfoods, Soya Foods, Soya Newsletter, Soya International, Soyfoods Canada Newsletter, etc. 857, 1424, 1560

Soyfoods Movement in Europe. 898, 956, 975, 982, 1000, 1119, 1150, 1210, 1231, 1236, 1237, 1241, 1278

Soyfoods Movement in North America (USA & Canada, General). 800, 1088

Soyfoods companies (Asia). *See* Yeo Hiap Seng Ltd. (Singapore and Malaysia) and Affiliates

Soyfoods companies (Canada). *See* Nutrisoya, Inc. (Quebec), Yves Veggie Cuisine (Vancouver, BC, Canada)

Soyfoods companies (England). *See* Itona

Soyfoods companies (Europe). *See* Albert's Tofuhaus (Lautersheim, Germany), British Arkady Company Ltd. (Manchester, England), Galactina S.A. (Belp, Switzerland), Haldane Foods Group Ltd. (Newport Pagnell, Buckinghamshire, England), Henselwerk GmbH (Magstadt near Stuttgart, Germany), Huegli Naehrmittel A.G. (Steinach-Arbon, Switzerland), Innoval / Sojalpe, Jonathan P.V.B.A. (Kapellen, Belgium), Lima N.V. / Lima Foods (Sint-Martens-Latem, Belgium; and Mezin, France), Manna Natural Foods (Amsterdam, The Netherlands), Migros & Conserves Estavayer (Estavayer-le-Lac, Switzerland), Nutrition et Soja, Div. of Nutrition et Santé (Revel near Toulouse, France). Formerly Société Soy, Sojinal / Biosoja (Formerly Cacoja), Soya Health Foods Ltd. (Manchester, England), Soyana (Zurich, Switzerland), Tofutown.com (Wiesbaum / Vulkaneifel, Germany), Triballat (Noyal-sur-Vilaine, France). Makers of Sojasun

Soyfoods companies (USA). *See* Farm Food Co. (San Rafael, then San Francisco, California), Farm Foods, and Farm Soy Dairy, GeniSoy Products Co. (Fairfield, California), Hain Celestial Group, Inc. (Uniondale, New York), Lightlife Foods, Inc. (Turners Falls, Massachusetts), Rella Good Cheese Co. (Santa Rosa, California). Previously Brightsong Tofu, SunRich Food Group (Hope, Minnesota), Swan Food Corp. (Miami, Florida), White Wave, Inc. (Boulder, Colorado)

Soyfoods movement. *See* Farm (The) (Summertown, Tennessee), Rodale Press (Emmaus, Pennsylvania), Soyatech (Bar Harbor, Maine), Soyfoods Association of North America (SANA)

Soyinfo Center (Lafayette, California). Named Soyfoods Center until 1 Jan. 2007. 797, 800, 805, 821, 826, 848, 851, 893, 894, 937, 940, 952, 955, 989, 1000, 1014, 1020, 1048, 1055, 1241, 1268, 1701, 1702, 1713

Soyland Farm. *See* Fouts Family of Indiana

Soymilk–Etymology of This Term and Its Cognates / Relatives in Various Languages. 273, 418

Soymilk–Marketing of. 1679

Soymilk Companies (Asia)–Kibun, Marusan-Ai, Mitsubishi, Meiji, and Saniku Shokuhin in Japan. 835, 908, 1034, 1166, 1253, 1299, 1713

Soymilk Equipment Companies (Europe). *See* APV Systems, Soya Technology Division. Formerly named Danish Turnkey Dairies Ltd., Alfa-Laval (Lund, Sweden), Tetra Pak International (Lund, Sweden)

Soymilk Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1166, 1209, 1228, 1278, 1296, 1358, 1384, 1409, 1446, 1463, 1468, 1483, 1587, 1588, 1590

Soymilk Industry and Market Statistics, Trends, and Analyses–Larger Companies. 1119, 1123, 1137, 1144, 1145, 1146, 1166, 1187, 1203, 1229, 1238, 1268, 1278, 1327, 1339, 1550, 1561, 1587, 1588, 1598, 1627, 1644, 1685, 1695, 1703, 1706, 1710

Soymilk Production–How to Make Soymilk on a Commercial Scale. 1559

Soymilk companies (Canada). *See* ProSoya, SoyaWorld, Inc. (Near Vancouver, British Columbia, Canada)

Soymilk companies (England). *See* Itona

Soymilk companies (Europe). *See* Alpro (Wevelgem, Belgium), Plamil Foods Ltd. (Folkestone, Kent, England) and The Plantmilk

Society, Unisoy Milk 'n' By-Products (Stockport, Cheshire, England)

Soymilk companies (USA). *See* American Soy Products (Saline, Michigan), Pacific Foods of Oregon, Inc. (Tualatin, Oregon), Vitasoy. WholeSoy & Co. (subsidiary of TAN Industries, Inc., California)

Soymilk, Fermented, in Liquid or Viscous Form (Basic Research, Acidophilus Soymilk or Soy Acidophilus Milk, Soy Viili, Buttermilk, Koumiss, Lassi, Piima, etc.). See also: Soy Yogurt, Soy Cheese, and Soy Kefir. 321, 1011, 1018, 1089, 1185, 1430

Soymilk, Soy Drinks / Beverages, Soy-Based Infant Formulas, and Nogs (Liquid, Non-Fermented). Note–For Soymilk Products See Tofu, Yuba, Shakes, Soy Ice Cream, Soy Yogurt, and Soy Cheese or Cheese Alternatives. 181, 185, 187, 198, 204, 256, 258, 273, 274, 275, 276, 283, 285, 286, 293, 307, 310, 312, 321, 347, 385, 386, 395, 397, 402, 403, 406, 407, 418, 424, 430, 432, 434, 440, 450, 473, 481, 496, 502, 509, 565, 583, 589, 592, 609, 617, 640, 643, 650, 651, 678, 700, 714, 716, 719, 735, 759, 763, 798, 805, 821, 822, 826, 835, 841, 845, 848, 855, 863, 868, 877, 879, 880, 888, 893, 894, 908, 923, 941, 957, 958, 967, 974, 977, 990, 991, 992, 1000, 1015, 1016, 1028, 1034, 1037, 1044, 1045, 1046, 1047, 1078, 1080, 1086, 1087, 1089, 1090, 1098, 1099, 1101, 1104, 1109, 1118, 1119, 1123, 1127, 1128, 1130, 1135, 1137, 1138, 1144, 1145, 1146, 1150, 1155, 1163, 1166, 1174, 1185, 1187, 1190, 1198, 1202, 1203, 1209, 1214, 1219, 1221, 1223, 1224, 1227, 1228, 1229, 1234, 1235, 1238, 1240, 1253, 1254, 1259, 1260, 1265, 1268, 1273, 1278, 1284, 1287, 1288, 1289, 1293, 1296, 1299, 1317, 1322, 1327, 1331, 1334, 1339, 1340, 1343, 1346, 1352, 1353, 1358, 1359, 1361, 1364, 1365, 1370, 1371, 1383, 1384, 1386, 1387, 1395, 1401, 1402, 1403, 1404, 1406, 1409, 1412, 1414, 1416, 1420, 1421, 1426, 1438, 1439, 1442, 1446, 1447, 1448, 1449, 1461, 1463, 1467, 1468, 1470, 1472, 1473, 1474, 1476, 1478, 1480, 1483, 1485, 1488, 1495, 1501, 1503, 1506, 1508, 1513, 1516, 1523, 1528, 1531, 1537, 1540, 1547, 1550, 1556, 1559, 1560, 1575, 1587, 1588, 1590, 1591, 1598, 1603, 1620, 1623, 1624, 1626, 1627, 1642, 1644, 1650, 1657, 1658, 1670, 1675, 1679, 1681, 1685, 1691, 1692, 1695, 1703, 1706, 1710, 1713

Soymilk, Spray-Dried or Powdered. 235, 321, 377, 763, 888, 1037, 1108, 1560, 1638

Soymilk, Used as an Ingredient in Non-Beverage Commercial Products Such as Ice Creams, Yogurts, Cheeses, Desserts, or Entrees. 973, 978

Soymilk. *See* Calf, Lamb, or Pig Milk Replacers

Soynut Butter (Soynuts / Roasted Soybeans Ground to a Paste Resembling Peanut Butter; May Also Be Made from Soy Flour Mixed with a Little Oil). 430, 1463

Soynut Butter–Etymology of This Term and Its Cognates / Relatives in Various Languages. 430

Soynut companies (Europe & USA). *See* Solnuts B.V. (Tilburg, The Netherlands; and Hudson, Iowa). Including Edible Soy Products

Soynuts (Oil Roasted or Dry Roasted). 321, 430, 496, 640, 763, 822, 826, 914, 1080, 1488, 1560, 1623, 1642

Soynuts–Etymology of This Term and Its Cognates / Relatives in Various Languages. 430

Spectrophotometry. *See* Seed Composition–High-Speed Measurement Techniques, such as Near Infrared Reflectance (NIR) Anlysis and Spectrophotometry

Spencer Kellogg & Sons, Inc. (Buffalo, New York). 942

Spillers Premier Products Ltd. (Puckeridge, Ware, Hertfordshire, England). Including Soya Foods Ltd [Named Soya Flour Manufacturing Co. Ltd. (1929-42), and Soya Foods Ltd. (1933)]. And incorporating British Soya Products (1932). 386, 402, 403

Sprouts, Non-Soy. See also Soy Sprouts. 1188

Sprouts. *See* Soy Sprouts

Spun soy protein fibers. *See* Soy Proteins–Textured Soy Protein Isolates

Sri Lanka. *See* Asia, South–Sri Lanka

St.-Pierre and Miquelon. *See* Oceania–Atlantic Ocean Islands that are Part of France–St.-Pierre and Miquelon

Staley (A.E.) Manufacturing Co. (Decatur, Illinois; Acquired by Tate & Lyle PLC in June 1988). 698, 1050, 1199

Standardization of nomenclature of soybean varieties. *See* Nomenclature of Soybean Varieties–Standardization of and Confusion

Standards for soyfoods. *See* Individual foods, e.g., Tofu Standards

Standards, Applied to Soybeans or Soy Products. 346, 857, 868

Statistics on crushing of soybeans, soy oil and meal production and consumption. *See* individual geographic regions (such as Asia, Europe, Latin America, United States, World, etc.) and nations within each region

Statistics on soybean production, area and stocks. *See* individual geographic regions (such as Asia, Europe, Latin America, United States, etc.) and nations within each region

Statistics on soybean production. *See* Soybean Production and Trade–Industry and Market Statistics,

Statistics on soybean yields. *See* Yield Statistics, Soybean

Statistics. *See* Industry and Market Analyses and Statistics, the specific product concerned, e.g. Tofu Industry and Market Statistics

Stephens, Arran and Ratana. *See* Lifestream Natural Foods Ltd. and Nature's Path (BC, Canada)

Sterols or Steroid Hormones in Soybeans (Phytosterols–Including Beta-Sitosterol, Campesterol, and Stigmasterol from Which Steroids Such as Progesterone, Hydrocortisone, and Cortisone Can Be Made). 592, 846, 891, 1013

Storage of Seeds, Viability During Storage or Storability, and Drying of Soybeans. 246, 321, 332, 418, 473, 496, 539, 653, 748, 868, 916, 1190

Straw, soybean. *See* Feeds / Forage from Soybean Plants–Straw

Strayer Family of Iowa–Incl. George Strayer (1910-1981; executive officer of the American Soybean Association 1940-1967), His Father Bert Strayer (1880-1941), and His Nephew Dennis Strayer (born 1938). 541

Sufu. *See* Tofu, Fermented

Sugars, complex, such as raffinose, stachyose, and verbacose. *See* Oligosaccharides

Sukiyaki–Famous Japanese Recipe and Dish. Its Basic Ingredients Include Tofu (Usually Grilled) and Soy Sauce. 441, 527

SunOpta, Inc. (Toronto, Ontario, Canada). Formerly SunRich Food Group (Hope, Minnesota). Formerly Minnesota Waxy Corn Growers Export Inc., Minnesota Edamame, Jameson-Williams Co. Acquired by Stake Technology Ltd. (Norval, Ontario, Canada) in July 1999, Stake changes its name to SunOpta on 31 Oct. 2003. 1279, 1598

SunRich Food Group (Hope, Minnesota). *See* SunOpta, Inc.

Sunflower Oil / Sunflowerseed Oil / Sunoil. 122, 132, 565, 844, 854, 884, 953, 1038, 1042, 1098, 1235, 1589, 1689

Sunflower Seeds and Sunflowers *(Helianthus annuus)*–Including Sunflowerseed Oil, Cake, and Meal. Once called the Heliotrope, Heliotropion, and Heliotropium. 104, 139, 296, 321, 326, 472, 494, 499, 565, 683, 717, 844, 854, 857, 884, 942, 1023, 1061, 1091, 1098, 1147, 1199, 1235, 1424, 1560, 1589, 1689

Sunrise Markets Inc. (Vancouver, BC, Canada). 1516, 1556, 1561, 1588, 1590, 1591, 1626, 1627, 1691, 1692

Sustainable Development and Growth, Including Low-Input Sustainable Agriculture (LISA), Renewable Energy Resources (Solar, Wind), Steady State Economics, and Voluntary Simplicity Worldwide. 1465

Swan Food Corp. (Miami, Florida). Started in 1977 by Robert Brooks and Mary Pung. 800

Swan Gardens Inc. and Soya Kaas Inc. (Atlanta, Georgia). 1213

Swift & Co. (Chicago, Champaign, and Oak Brook, Illinois). 698, 1047, 1050

TKW (Germany). *See* Tofukost-Werk GmbH

Tahini or tahina or tahin. *See* Sesame Butter

Taiwan. *See* Asia, East–Taiwan

Tamari, Including Real Tamari (Soy Sauce Which Contains Little or No Wheat) or the Macrobiotic Word Tamari Meaning Traditional Shoyu. 662, 683, 972, 988, 1014, 1062, 1088, 1159, 1272, 1451, 1599, 1642, 1707

Tariffs, duties, embargoes. *See* Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums, and Other Trade Barriers or Subsidies

Taste Panel, Taste Test Results, or Sensory / Organoleptic Evaluation of the Quality of Foods and Beverages. 1204

Tauco–Indonesian-Style Fermented Soybean Paste. Also Spelled Taucho, Tauceo, Tau Chiow, Taoco, Tao-Tjo, Taotjo, Taocho, Taoetjo. 385, 788, 826

Taxonomy. *See* Soybean–Taxonomy

Tempeh (Spelled *Témpé* in Malay-Indonesian). 385, 470, 475, 652, 763, 777, 778, 797, 812, 813, 817, 821, 822, 826, 858, 859, 868, 876, 880, 882, 883, 888, 892, 897, 899, 937, 950, 952, 970, 979, 981, 988, 994, 1000, 1020, 1024, 1026, 1031, 1033, 1037, 1043, 1049, 1053, 1055, 1056, 1062, 1065, 1073, 1074, 1076, 1080, 1095, 1099, 1105, 1107, 1117, 1120, 1131, 1133, 1156, 1161, 1163, 1169, 1175, 1177, 1178, 1194, 1196, 1197, 1204, 1212, 1227, 1239, 1246, 1248, 1250, 1269, 1281, 1301, 1318, 1343, 1345, 1430, 1453, 1493, 1500, 1502, 1513, 1523, 1529, 1530, 1537, 1560, 1575, 1579, 1580, 1581, 1582, 1610, 1638, 1642, 1645, 1659, 1667, 1668, 1670, 1673, 1682, 1687

Tempeh–Etymology of This Term and Its Cognates / Relatives in Various Languages. 385, 1020, 1055

Tempeh Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1020, 1055

Tempeh Industry and Market Statistics, Trends, and Analyses–Larger Companies. 899, 1020, 1055, 1095, 1133, 1248

Tempeh companies (Canada). *See* Noble Bean (Ontario, Canada)

Tempeh companies (USA). *See* Appropriate Foods, Inc. (Brooklyn, New York)

Tempeh companies. *See* Turtle Island Foods, Inc. (Hood River, Oregon. Maker of Tofurky and Tempeh)

Tempeh in Second Generation Products, Documents About. 826

Tempeh, Non-Soy Relatives–Onchom (Oncom, Ontjom)–A cake of Peanut Presscake or Okara (Oncom Tahu) Fermented with *Neurospora (Monilia sitophila = Oidium lupuli)* molds. 385, 826, 1037

Tempeh, Non-Soy Relatives–Other Substrates Such as Winged Beans, Lupins, Velvet Beans, Brown Rice, Cassava, etc. 826, 1204

Tempeh, Non-Soy Relatives–Tempeh Bongkrek–A Cake of Fermented Coconut Presscake or Grated Coconut. 817, 826

Tempeh, Used as an Ingredient in Second Generation Commercial Products Such as Entrees, etc. 1010, 1072, 1075, 1096

Tempehworks. *See* Lightlife Foods, Inc.

Temperance movement (abstaining from alcohol) and vegetarianism. *See* Vegetarianism and the Temperance Movement Worldwide

Teriyaki Sauce and Teriyaki (Soy Sauce is the Main Sauce Ingredient). 1062, 1159, 1244, 1514, 1555, 1638, 1654, 1667, 1687

Tetra Pak International (Lund, Sweden). 1089, 1170, 1209, 1229, 1340, 1713

Textiles made from spun soy protein fibers. *See* Fibers (Artificial Wool or Textiles Made from Spun Soy Protein Fibers, Including Azlon, Soylon, and Soy Silk / Soysilk)

Textured soy flours. *See* Soy Flours, Textured (Including TVP, Textured Vegetable Protein)

Textured soy protein isolates. *See* Soy Protein Isolates, Textured (For Food Use Only). Including Spun Fibers

Textured soy proteins. *See* Soy Proteins, Textured

Therapeutic aspects of soybeans, general. *See* Medical / Medicinal-Therapeutic Aspects, General

Third World. 538, 868, 955, 1008, 1041

Thyroid function. *See* Goitrogens and Thyroid Function

Tillage practices. *See* Soybean Cultural Practices–No Till Farming

Timor-Leste (East Timor). *See* Asia, Southeast–Timor-Leste (East Timor)

Tivall (Tivol), Maker of Meat Alternatives (Ashrat, Israel). 1658

Tocopherols. *See* Vitamins E (Tocopherols)

Tofu (Also Called Soybean Curd or Bean Curd until about 1975-1985). See also Tofu–Fermented, Soy Ice Creams, Soy Yogurts, and Cheesecake, Which Often Use Tofu as a Major Ingredient. 53, 68, 69, 73, 75, 77, 78, 82, 87, 90, 91, 93, 95, 97, 107, 108, 124, 129, 133, 137, 170, 235, 256, 258, 273, 276, 283, 286, 296, 307, 310, 312, 321, 328, 339, 347, 355, 383, 385, 402, 406, 407, 430, 475, 485, 496, 497, 509, 632, 640, 662, 719, 763, 788, 791, 800, 805, 818, 821, 822, 825, 826, 841, 848, 849, 851, 853, 856, 866, 868, 875, 880, 881, 886, 888, 892, 893, 895, 897, 898, 901, 902, 905, 906, 910, 912, 924, 936, 938, 941, 948, 954, 956, 960, 961, 963, 965, 967, 969, 975, 980, 981, 982, 983, 984, 988, 995, 1000, 1012, 1027, 1037, 1043, 1046, 1048, 1054, 1057, 1058, 1062, 1065, 1078, 1080, 1093, 1097, 1098, 1103, 1113, 1117, 1119, 1144, 1163, 1166, 1172, 1181, 1190, 1201, 1202, 1210, 1213, 1214, 1216, 1217, 1218, 1226, 1227, 1231, 1236, 1237, 1238, 1239, 1241, 1242, 1244, 1255, 1257, 1258, 1264, 1267, 1268, 1269, 1270, 1277, 1278, 1281, 1283, 1290, 1294, 1297, 1298, 1301, 1302, 1323, 1324, 1327, 1339, 1340, 1346, 1347, 1349, 1362, 1371, 1408, 1409, 1430, 1445, 1451, 1463, 1478, 1479, 1488, 1489, 1491, 1500, 1506, 1508, 1509, 1513, 1523, 1525, 1537, 1540, 1552, 1554, 1559, 1560, 1575, 1579, 1580, 1581, 1582, 1590, 1592, 1602, 1608, 1609, 1612, 1615, 1624, 1626, 1631, 1632, 1636, 1637, 1638, 1642, 1645, 1646, 1648, 1657, 1658, 1659, 1664, 1667, 1668, 1670, 1675, 1685, 1687, 1688, 1692, 1695, 1703, 1706, 1710

Tofu (all kinds)–Imports, Exports, International Trade. 77, 87, 90, 93, 108

Tofu–Etymology of This Term and Its Cognates / Relatives in Various Languages. 95, 256, 273, 310, 407, 763

Tofu Equipment. 1161

Tofu Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 497, 763, 897, 1113, 1170, 1201, 1231, 1236, 1281, 1463

Tofu Industry and Market Statistics, Trends, and Analyses–Larger Companies. 851, 1113, 1201, 1231, 1239, 1278, 1339, 1695, 1703, 1710

Tofu Industry and Market Statistics, Trends, and Analyses–Smaller Companies. 924, 948, 956, 969, 1012, 1054, 1181, 1182, 1451

Tofu International Ltd. and Rosewood Products Inc. (Ann Arbor, Michigan) (The Soy Plant before 1987). 800

Tofu Production–How to Make Tofu on a Commercial Scale. 886

Tofu Standards or Standard of Identity. 1048

Tofu companies (Canada). *See* Sunrise Markets Inc. (Vancouver, BC, Canada)

Tofu companies (Europe). *See* Auenland Tofu und Soja Produkte (Prien-Chiemsee, Germany), Cauldron Foods Ltd. (Bristol, England), Heuschen-Schrouff B.V. (Landgraaf, Netherlands), Sojarei Vollwertkost GmbH (Traiskirchen, near Vienna, Austria). Formerly Sojarei Ebner-Prosl, Soyastern Naturkost GmbH / Dorstener Tofu Produktions GmbH (Dorsten, Germany), Tofukost-Werk TKW GmbH (Wadersloh, Germany), Tofurei Svadesha Naturkost Produkte GmbH (Munich, Germany). Including Byodo Naturkost

Tofu companies (USA). *See* Azumaya, Inc. (San Francisco, California), House Foods America Corporation (Los Angeles, California), Island Spring, Inc. (Vashon, Washington), Morinaga

Nutritional Foods, Inc., and Morinaga Nyûgyô (Torrance, California, and Tokyo, Japan), Nasoya Foods, Inc. (Leominster, Massachusetts). Subsidiary of Vitasoy, Northern Soy, Inc. (Rochester, New York), Quong Hop & Co. (South San Francisco, California), Swan Gardens Inc. and Soya Kaas Inc. (Atlanta, Georgia), Tofu International Ltd. and Rosewood Products Inc. (Ann Arbor, Michigan), Tomsun Foods, Inc. (Greenfield, Massachusetts; Port Washington, New York, Wildwood Harvest, Inc.

Tofu in Second Generation Products, Documents About. 845, 1099, 1115, 1317, 1343

Tofu, Fermented (Also Called *Doufu-ru, Toufu-ru, Furu, Fuyu, Tahuri, Tahuli, Tajure, Tao-hu-yi*, or Sufu). See also *Tofu-yo*. 82, 91, 129, 296, 307, 321, 385, 763, 822, 1445, 1494, 1640, 1651

Tofu, Flavored / Seasoned / Marinated and Baked, Broiled, Grilled, Braised, or Roasted. Including Tofu Jerky and Savory Baked Tofu. 949

Tofu, Flavored, Seasoned, or Marinated, but not Baked, Broiled, Grilled, Braised, or Roasted. Including most Five-Spice Pressed Tofu *(wu-hsiang toufukan / wuxiang doufugan)*. 1182, 1245, 1290

Tofu, Fried (Especially Pouches, Puffs, Cutlets, or Burgers; Agé or Aburagé, Atsu-agé or Nama-agé, Ganmodoki or Ganmo). 307, 763, 845, 892, 911, 947, 956, 1176, 1182, 1210, 1239, 1266, 1638

Tofu, Frozen or Dried-Frozen–Etymology of This Term and Its Cognates / Relatives in Various Languages. 74

Tofu, Frozen, Dried-frozen, or Dried Whole (Not Powdered). 74, 321, 402, 763, 1638

Tofu, Grilled, Braised, Broiled, or Roasted *(Yaki-dôfu* in Japanese). A Japanese-Style Commercial Product. 763, 1638, 1664

Tofu, Homemade–How to Make at Home or on a Laboratory or Community Scale, by Hand. 662

Tofu, Pressed, Chinese-Style *(Toufukan / Doufugan)*. 131, 136

Tofu, Silken (Kinugoshi). 763, 822, 1170, 1201, 1231, 1636, 1637, 1638

Tofu, Smoked. 1176, 1239, 1245, 1282

Tofu, Used as an Ingredient in Second Generation Commercial Products Such as Dressings, Entrees, Ice Creams, etc. 878, 943, 944, 945, 946, 947, 949, 962, 967, 1004, 1005, 1006, 1102, 1139, 1176, 1182, 1245, 1266, 1282, 1310, 1515, 1635

Tofu, baked or broiled at flavored / seasoned/marinated. *See* Tofu, Flavored/Seasoned/Marinated and Baked, Broiled, Grilled, Braised, or Roasted

Tofukost-Werk TKW GmbH (Wadersloh, Germany). 1027, 1231

Tofurei Svadesha Naturkost Produkte GmbH (Munich, Germany). Including Byodo Naturkost. 1027, 1236, 1239

Tofutown.com (formerly Viana Naturkost GmbH) and Bernd Drosihn (Wiesbaum / Vulkaneifel, Germany). 1658

Tofutti Brands, Inc. (Cranford, New Jersey)–Soy Ice Cream Company. Mintz's Buffet Until Jan. 1982. 1046, 1048, 1058, 1089, 1093, 1130, 1134, 1148, 1149, 1157, 1172

Tomsun Foods, Inc. (Greenfield, Massachusetts; Port Washington, New York. Named New England Soy Dairy from 1978-1983). 800

Tonga. *See* Oceania

Toxins and Toxicity in Foods and Feeds–Bongkrek Poisoning, Caused by Either Bongkrek Acid or Toxoflavin Produced in Some Coconut Tempeh by the Aerobic Bacteria *Pseudomonas cocovenenans*. 826

Tractors. 331, 542, 1557

Trade (International–Imports, Exports) of Soybeans, Soy Oil, and / or Soybean Meal. See also Trade–Tariffs and Duties. 188, 203, 206, 207, 208, 210, 211, 212, 222, 223, 225, 229, 232, 235, 249, 253, 256, 258, 261, 273, 286, 291, 296, 299, 304, 308, 313, 321, 325, 331, 332, 347, 348, 380, 385, 386, 402, 403, 422, 438, 497, 521, 549, 592, 597, 620, 625, 718, 763, 775, 839, 857, 862, 865, 866, 917, 1061, 1098, 1143, 1147, 1151, 1167, 1180, 1199, 1207, 1291, 1314, 1424, 1559, 1560, 1594, 1625, 1641, 1657

Trade Policies (International) Concerning Soybeans, Soy Products, or Soyfoods–Tariffs, Duties, Embargoes, Moratoriums, and Other Trade Barriers or Subsidies. 222, 288, 296, 299, 300, 563, 576, 625, 717, 775, 1167, 1180, 1225

Trade of Soyfoods (Import and Export, not Including Soy Oil or Soybean Meal, but Including Lecithin and Margarine) or Soyfoods Manufacturing Equipment. See also: Soy Sauce–Imports, Exports. Miso–Imports, Exports. 119, 175, 217, 218, 256, 323, 522, 559, 642, 683, 730, 835, 908, 938, 958, 972, 990, 1028, 1034, 1144, 1152, 1159, 1166, 1170, 1174, 1201, 1205, 1219, 1224, 1253, 1272, 1279, 1299

Trade statistics, Canada. *See* Canada–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Central America. *See* Latin America–Central America–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, China. *See* China–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, East Asia. *See* Asia, East–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Japan. *See* Japan–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trade statistics, Korea. *See* Korea–Trade (Imports or Exports) of Soybeans, Soy Oil, and / or Soybean Meal–Statistics

Trans Fatty Acids. 1292, 1300

Transportation of Soybeans or Soy Products to Market by Railroad / Railway / Rail within a Particular Country or Region. See also Railroads / Railways and Special Trains Used to Promote Soybeans and Soybean Production. 332, 348, 497

Transportation of Soybeans or Soy Products to Market by Roads or Highways Using Trucks, Carts, etc. within a Particular Country or Region. 393, 496, 1388

Transportation of Soybeans or Soy Products to Market by Water (Rivers, Lakes) Using Junks, Barges, etc. within a Particular Country or Region. 246, 296, 403

Tree of Life (St. Augustine, Florida). Purchased in Dec. 1985 by Netherlands-based Royal Wessanen NV Co. 1088, 1294

Triballat (Noyal-sur-Vilaine, France). Makers of Sojasun; and its Affiliate Bonneterre (Rungis Cedex, France). 1185

Triple "F" and Insta-Pro. *See* Extruders and Extrusion Cooking, Low Cost–Including Triple "F"

Tropical and Subtropical Countries, Soybean Production in (Mostly in the Third World / developing countries). 387, 538, 793, 804, 1030, 1126

Tropical kudzu. *See* Kudzu or Kuzu–Tropical Kudzu or Puero *(Pueraria phaseoloides)*

Trucks or Carts used to transport soybeans. *See* Transportation of Soybeans or Soy Products to Market by Roads or Highways

Trypsin / Protease / Proteinase Inhibitors. 651, 1032, 1125, 1200, 1336, 1338, 1341, 1373, 1454, 1461, 1466, 1546, 1559, 1565

Turkey. *See* Asia, Middle East–Turkey

Turkistan / Turkestan. *See* Asia, Central–Turkistan / Turkestan

Turtle Island Foods, Inc. (Hood River, Oregon. Maker of Tofurky and Tempeh). 1658

Tuvalu. *See* Oceania

TVP. *See* Soy Flours, Textured (Including TVP, Textured Vegetable Protein)

Ultrafiltration. *See* Membrane Technology Processes

Umeboshi or ume-boshi (Japanese salt plums / pickled plums), Plum Products, and the Japanese Plum Tree *(Prunus mumé)* from whose fruit they are made. 1575

Unfair Practices–Including Possible Deceptive / Misleading Labeling, Advertising, etc. See also: Adulteration. 732, 1093, 1241, 1614

Unilever Corp., Lever Brothers Co., Unimills B.V. (Netherlands), and Margarine Union. 698, 1047, 1050, 1663

Unisoy Milk 'n' By-Products (Stockport, Cheshire, England). 1278

United Kingdom, health foods movement and industry. *See* Health Foods Movement and Industry in United Kingdom

United Kingdom. *See* Europe, Western–United Kingdom

United Nations (Including UNICEF, FAO, UNDP, UNESCO, and UNRRA) Work with Soy. 507, 529, 538, 660, 682, 691, 700, 713, 727, 729, 760, 763, 868, 928, 987, 1001, 1068, 1077, 1081, 1126, 1151, 1190, 1195, 1205, 1296, 1313, 1331, 1340, 1376, 1455, 1534, 1535, 1655

United Soybean Board. *See* American Soybean Association (ASA)–United Soybean Board

United States–States–Alabama. 296, 405, 482, 1061, 1199, 1499

United States–States–Alaska. 662

United States–States–Arizona. 662, 800, 1048

United States–States–Arkansas. 172, 192, 405, 662, 830, 942, 1048, 1061, 1098, 1179, 1399, 1448, 1486, 1605

United States–States–California. 131, 136, 172, 323, 388, 405, 453, 471, 506, 510, 534, 541, 542, 559, 565, 570, 578, 583, 586, 592, 597, 603, 634, 648, 662, 673, 683, 787, 797, 800, 805, 821, 826, 830, 848, 851, 886, 893, 894, 898, 932, 937, 940, 952, 955, 956, 989, 1014, 1020, 1048, 1055, 1115, 1170, 1201, 1203, 1210, 1213, 1214, 1230, 1279, 1297, 1299, 1322, 1339, 1340, 1348, 1377, 1412, 1476, 1500, 1506, 1514, 1546, 1547, 1553, 1555, 1575, 1577, 1587, 1593, 1597, 1598, 1614, 1623, 1626, 1649, 1658, 1661, 1678, 1679, 1690, 1701, 1702, 1713

United States–States–Colorado. 405, 662, 683, 800, 1048, 1081, 1299, 1430, 1587, 1604

United States–States–Connecticut. 172, 662, 800, 1047, 1600

United States–States–Delaware. 296, 405, 549

United States–States–District of Columbia (Washington, DC). 192, 296, 321, 348, 369, 405, 428, 438, 482, 496, 497, 620, 622, 661, 662, 697, 713, 719, 729, 734, 760, 762, 877, 1002, 1023, 1041, 1047, 1471, 1615, 1621

United States–States–Florida. 405, 662, 800, 1047, 1272, 1275, 1327, 1540, 1614, 1690

United States–States–Georgia. 172, 192, 405, 482, 662, 942, 1048, 1179, 1214, 1286, 1377, 1416, 1420, 1505

United States–States–Hawaii. 66, 172, 178, 217, 218, 296, 311, 313, 321, 323, 325, 326, 379, 385, 662, 737, 793, 800, 803, 804, 900, 939, 957, 1106, 1294, 1429, 1479, 1514, 1554, 1555, 1615, 1621, 1626, 1669

United States–States–Idaho. 1048, 1689

United States–States–Illinois. 126, 172, 192, 217, 218, 296, 321, 331, 369, 374, 385, 405, 474, 482, 523, 542, 570, 597, 622, 662, 672, 673, 677, 689, 691, 698, 721, 723, 732, 737, 738, 741, 742, 744, 747, 763, 769, 787, 796, 800, 802, 803, 804, 822, 827, 831, 868, 900, 921, 928, 942, 957, 968, 985, 986, 1008, 1019, 1029, 1047, 1048, 1050, 1061, 1064, 1081, 1098, 1110, 1126, 1142, 1149, 1152, 1171, 1179, 1180, 1199, 1200, 1215, 1220, 1243, 1247, 1280, 1286, 1295, 1296, 1315, 1321, 1322, 1328, 1339, 1344, 1377, 1381, 1429, 1463, 1492, 1497, 1499, 1558, 1563, 1578, 1593, 1605, 1626, 1647, 1648, 1666, 1676, 1689, 1690, 1713

United States–States–Indiana. 172, 192, 295, 296, 385, 405, 482, 515, 662, 800, 1098, 1179, 1296, 1322, 1447

United States–States–Introduction of Soy Products to. Earliest document seen concerning soybean products in a certain U.S. state. Soybeans as such have not yet been reported in this state. 66

United States–States–Introduction of Soy Products to. This document contains the earliest date seen for soybean products in a certain U.S. state. Soybeans as such had not yet been reported by that date in this state. 66

United States–States–Introduction of Soybeans to. Earliest document seen concerning soybeans or soyfoods in connection with (but not yet in) a certain U.S. state. 172

United States–States–Introduction of Soybeans to. Earliest document seen concerning the cultivation of soybeans in a certain U.S. state. 172

United States–States–Introduction of Soybeans to. This document contains the earliest date seen for the cultivation of soybeans in a certain U.S. state. 172

United States–States–Iowa. 192, 369, 385, 405, 536, 662, 672, 673, 677, 684, 789, 800, 816, 857, 942, 1098, 1143, 1377, 1492, 1541, 1557, 1605, 1626, 1671, 1686, 1690, 1700, 1708, 1712

United States–States–Kansas. 172, 321, 385, 405, 942, 1141, 1206, 1303, 1557

United States–States–Kentucky. 172, 296, 405, 482, 1047, 1179, 1437, 1499

United States–States–Louisiana. 173, 192, 405, 482, 662, 1179, 1669

United States–States–Maine. 172, 662, 857, 1424, 1560

United States–States–Maryland. 172, 192, 385, 405, 482, 496, 497, 549, 662, 757, 800, 871, 1051, 1161, 1193, 1230, 1275, 1634, 1643, 1666, 1690

United States–States–Massachusetts. 127, 135, 172, 321, 385, 662, 800, 1020, 1041, 1047, 1048, 1055, 1088, 1294, 1297, 1340, 1348, 1349, 1406, 1604, 1626, 1685, 1690, 1694, 1695, 1703, 1706, 1710

United States–States–Michigan. 172, 369, 373, 397, 405, 589, 662, 683, 759, 800, 1047, 1166, 1179, 1224, 1259, 1322, 1463, 1465, 1650, 1713

United States–States–Minnesota. 148, 172, 405, 536, 570, 662, 675, 677, 685, 686, 687, 800, 942, 1098, 1279, 1296, 1297, 1389, 1542, 1598, 1602, 1671, 1694

United States–States–Mississippi. 172, 296, 313, 325, 385, 405, 661, 662, 738, 1081, 1179

United States–States–Missouri. 172, 192, 217, 218, 296, 331, 385, 405, 482, 570, 620, 662, 857, 931, 1079, 1098, 1143, 1179, 1192, 1296, 1507, 1509, 1578, 1669, 1681, 1690

United States–States–Nebraska. 172, 296, 1048, 1626

United States–States–Nevada. 662

United States–States–New Hampshire. 172, 405, 662, 800

United States–States–New Jersey. 152, 172, 405, 640, 662, 731, 1046, 1047, 1048, 1058, 1084, 1089, 1093, 1134, 1148, 1149, 1157, 1161, 1172, 1302

United States–States–New Mexico. 662, 800, 1500

United States–States–New York. 152, 172, 192, 296, 323, 331, 342, 357, 382, 385, 396, 405, 419, 433, 521, 603, 662, 698, 730, 731, 732, 800, 892, 1047, 1048, 1061, 1079, 1084, 1191, 1199, 1200, 1201, 1232, 1249, 1322, 1348, 1349, 1593, 1658, 1680, 1681, 1713

United States–States–North Carolina. 172, 296, 313, 321, 325, 385, 405, 428, 482, 662, 868, 942, 1179, 1396, 1460, 1466, 1498, 1499, 1604, 1614

United States–States–North Dakota. 405, 482, 662, 884, 1179, 1256, 1661, 1689

United States–States–Ohio. 172, 192, 296, 385, 405, 467, 482, 515, 521, 589, 662, 698, 787, 800, 942, 1047, 1098, 1179, 1203, 1291, 1339, 1396, 1416, 1477, 1593, 1689, 1690, 1694

United States–States–Oklahoma. 172, 296, 405, 482, 662, 1179, 1200

United States–States–Oregon. 172, 328, 405, 597, 662, 800, 892, 1406, 1598, 1649, 1658, 1713

United States–States–Pennsylvania. 172, 324, 405, 440, 482, 662, 787, 1023, 1242, 1593

United States–States–Rhode Island. 172, 662, 1179

United States–States–South Carolina. 172, 296, 405, 662, 942, 1061, 1179, 1199

United States–States–South Dakota. 172, 482, 1690

United States–States–Tennessee. 172, 296, 405, 482, 763, 942, 1048, 1173, 1179, 1214, 1242, 1482, 1605, 1659

United States–States–Texas. 172, 296, 405, 482, 609, 662, 800, 889, 1110, 1179, 1242

United States–States–Utah. 662

United States–States–Vermont. 172, 662, 1297

United States–States–Virginia. 128, 135, 137, 172, 192, 296, 313, 325, 405, 455, 482, 549, 662, 942, 1051, 1179

United States–States–Washington state. 172, 217, 218, 305, 323, 328, 332, 455, 597, 603, 683, 800, 830, 1048, 1272, 1370, 1428, 1447, 1466, 1498, 1499, 1540, 1587

United States–States–West Virginia. 172, 385, 405, 800

United States–States–Wisconsin. 172, 192, 321, 385, 405, 418, 482, 570, 662, 800, 889, 938, 1114, 1179, 1514, 1555, 1597, 1605, 1617, 1626

United States Department of Agriculture (USDA)–Agricultural Research Service (ARS, Established 1953). Including Agricultural Research Administration (1942-1953). 553, 597, 739, 757, 763, 1081, 1492

United States Department of Agriculture (USDA)–Arlington Experimental Farm at Arlington, Virginia (1900-1942). 192, 296, 405, 428

United States Department of Agriculture (USDA)–Bureau of Agricultural Economics (1922-1953). Including Bureau of Markets and Crop Estimates (1921-1922), Bureau of Markets (1913-1921), and Office of Farm Management and Farm Economics (1905-1922). Transferred in 1953 to USDA's Economic Research Service. 427

United States Department of Agriculture (USDA)–Bureau of Plant Industry, Soils, and Agricultural Engineering (1943-1953). Including Bureau of Plant Industry (1901-1943), Office of Plant Industry (1900-1901), and Division of Agrostology (1895-1901). Transferred to Agricultural Research Service in 1953. 172, 192, 296, 321, 322, 331, 348, 405, 422, 428, 438, 482, 496, 497, 738, 1047

United States Department of Agriculture (USDA)–Economic Research Service (ERS). 762, 1225

United States Department of Agriculture (USDA)–Foreign Agricultural Service (FAS, Est. 1953) Including Office of Foreign Agricultural Relations (1939-1953). Foreign Agricultural Service (1938-1939). 532, 620, 645, 1279

United States Department of Agriculture (USDA)–Section of Foreign Seed and Plant Introduction (Established 1898 within the USDA with David Fairchild in Charge). Transferred to Bureau of Plant Industry (1 July 1901). Later Referred to as the Office of Foreign Seed and Plant Introduction and then the Office of Foreign Plant Introduction. 296, 482, 622, 661, 738, 1002, 1200

United States Department of Agriculture (USDA)–War Food Administration (WFA), Including the Food Production and Distribution Administration. 1322

United States Department of Agriculture (USDA; Including Federal Grain Inspection Service [FGIS], and War Food Administration [WFA]). See also: Agricultural Marketing Service, Agricultural Research Service (ARS), Bureau of Plant Industry, Economic Research Service, Food and Nutrition Service, Foreign Agricultural Service, and Section of Foreign Seed and Plant Introduction. 176, 240, 247, 253, 340, 461, 543, 592, 625, 713, 715, 729, 760, 822, 955, 1041, 1179, 1465, 1505, 1626, 1663

United States of America (USA). 80, 97, 115, 121, 122, 128, 131, 132, 136, 137, 148, 152, 157, 172, 173, 176, 192, 217, 218, 235, 240, 246, 251, 253, 256, 258, 273, 277, 295, 296, 305, 307, 308, 311, 312, 313, 314, 319, 320, 321, 323, 324, 325, 326, 328, 331, 332, 340, 347, 351, 357, 369, 373, 374, 379, 382, 385, 386, 387, 388, 396, 397, 402, 403, 405, 406, 407, 418, 419, 422, 427, 428, 430, 433, 435, 438, 440, 455, 460, 464, 470, 471, 473, 474, 482, 496, 497, 502, 506, 510, 515, 518, 521, 522, 523, 529, 536, 538, 542, 549, 553, 559, 565, 570, 578, 580, 586, 589, 592, 597, 603, 609, 620, 622, 625, 626, 634, 635, 640, 642, 645, 648, 661, 662, 663, 672, 673, 677, 681, 683, 684, 685, 687, 689, 691, 697, 698, 713, 715, 716, 717, 718, 719, 721, 723, 729, 730, 731, 732, 734, 737, 738, 739, 741, 742, 743, 744, 757, 759, 760, 761, 762, 763, 769, 787, 789, 791, 792, 793, 795, 796, 800, 802, 803, 804, 805, 807, 816, 821, 822, 826, 827, 830, 831, 839, 845, 848, 851, 857, 868, 877, 879, 884, 886, 889, 892, 893, 894, 898, 900, 907, 916, 917, 921, 928, 929, 931, 935, 937, 938, 939, 940, 942, 952, 954, 955, 956, 966, 968, 985, 986, 987, 989, 1001, 1002, 1008, 1014, 1019, 1020, 1023, 1029, 1041, 1046, 1047, 1048, 1050, 1051, 1055, 1058, 1061, 1064, 1078, 1079, 1080, 1081, 1083, 1084, 1088, 1089, 1092, 1093, 1094, 1098, 1106, 1110, 1114, 1115, 1124, 1126, 1130, 1134, 1141, 1142, 1143, 1147, 1148, 1149, 1152, 1154, 1157, 1161, 1166, 1167, 1170, 1171, 1172, 1173, 1179, 1180, 1190, 1191, 1192, 1193, 1195, 1196, 1199, 1200, 1201, 1203, 1205, 1206, 1210, 1211, 1213, 1214, 1215, 1220, 1224, 1225, 1230, 1232, 1237, 1242, 1247, 1249, 1256, 1257, 1258, 1259, 1272, 1275, 1279, 1280, 1286, 1291, 1294, 1295, 1296, 1297, 1299, 1302, 1303, 1309, 1312, 1315, 1320, 1321, 1322, 1328, 1339, 1340, 1344, 1345, 1348, 1349, 1350, 1370, 1377, 1381, 1383, 1387, 1396, 1399, 1406, 1407, 1416, 1420, 1424, 1428, 1429, 1430, 1434, 1437, 1441, 1442, 1444, 1447, 1448, 1457, 1460, 1463, 1465, 1466, 1471, 1477, 1479, 1482, 1486, 1492, 1497, 1498, 1499, 1505, 1507, 1509, 1511, 1514, 1527, 1540, 1541, 1542, 1543, 1549, 1553, 1554, 1555, 1557, 1558, 1559, 1560, 1563, 1566, 1575, 1577, 1578, 1583, 1584, 1587, 1588, 1590, 1591, 1593, 1594, 1596, 1597, 1598, 1600, 1602, 1604, 1605, 1611, 1614, 1617, 1622, 1623, 1626, 1627, 1634, 1643, 1647, 1648, 1649, 1650, 1657, 1659, 1661, 1662, 1663, 1666, 1669, 1670, 1671, 1672, 1676, 1678, 1679, 1681, 1684, 1685, 1686, 1689, 1690, 1691, 1694, 1695, 1700, 1703, 1705, 1706, 1708, 1710, 1711, 1712, 1713

United States of America–Activities and Influence Overseas / Abroad. 247, 255, 338, 342, 348, 452, 461, 462, 466, 467, 470, 534, 541, 543, 571, 606, 637, 639, 646, 647, 676, 747, 758, 794, 842, 871, 873, 1085, 1278, 1388, 1389, 1412, 1476, 1500, 1565, 1615, 1621, 1625, 1641

United States of America–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 313, 325, 326, 347, 402, 597, 857, 1098, 1143, 1313

United States of America, soyfoods movement in. *See* Soyfoods Movement in North America

Urease. *See* Enzymes in the Soybean–Urease and Its Inactivation

U.S. Regional Soybean Industrial Products Laboratory (Urbana, Illinois). Founded April 1936. 192, 482, 523

USA. *See* United States of America

USDA National Agricultural Library (NAL, Beltsville, Maryland). *See* National Agricultural Library (NAL, Beltsville, Maryland)

USDA. *See* United States Department of Agriculture

USSR. *See* Europe, Eastern–USSR

Van Gundy, Dorothea. *See* Seventh-day Adventists–Cookbooks and Their Authors

Van Gundy, Theodore A., and La Sierra Industries (La Sierra, California). 830, 893

Vanaspati (Vegetable Shortening, Vegetable Ghee, or Vanaspati Ghee). 521

Vandemoortele N.V. (Izegem, Netherlands). Including Alpro (Early Years Only) and Vamo. 1166, 1713

Vanuatu. *See* Oceania

Varieties of soybeans–Earliest document seen... *See* Historical–Earliest Document Seen

Varieties, soybean–Japanese. *See* Japanese Soybean Types and Varieties

Varieties, soybean. *See* Soybean Varieties, Soybean Varieties USA–Large-Seeded Vegetable-Type

Variety Development and Breeding of Soybeans (General, Including Varieties and Seeds). 256, 258, 267, 394, 426, 428, 469, 473, 474, 493, 496, 501, 512, 519, 536, 539, 546, 547, 572, 601, 602, 628, 647, 666, 679, 680, 690, 691, 693, 696, 706, 737, 740, 747, 748, 755, 756, 758, 782, 787, 792, 827, 896, 900, 918, 1001, 1029, 1124, 1126, 1151, 1164, 1190, 1647

Variety Development, Breeding, Selection, Evaluation, Growing, or Handling of Soybeans for Food Uses. 866, 1078, 1276

Variety development of soybeans. *See* Breeding of Soybeans and Classical Genetics, Breeding or Evaluation of Soybeans for Seed Quality, such as Low in Trypsin Inhibitors, Lipoxygenase, Linolenic Acid, etc., Germplasm Collections and Resources, and Gene Banks, Introduction of Soybeans (as to a Nation, State, or Region, with P.I. Numbers for the USA) and Selection, Irradiation of Soybeans for Breeding and Variety Development

Variety names / nomenclature–standardization. *See* Nomenclature of Soybean Varieties–Standardization of

Variety names of early U.S. soybeans. *See* Lists and Descriptions (Official) of Early U.S. Soybean Varieties with Their P.I. Numbers and Synonyms

Vegan cookbooks. *See* Vegetarian Cookbooks–Vegan Cookbooks

Veganism. *See* Vegetarianism–Veganism

Vegetable oils. *See* Specific Oilseeds such as Peanut Oil, Sesame Oil, Sunflower Oil, etc

Vegetable soybeans. *See* Green Vegetable Soybeans

Vegetable-type soybeans. *See* Green Vegetable Soybeans–Vegetable-Type, Garden-Type, or Edible or Food-Grade Soybeans

Vegetarian / Natural Foods Products Companies. *See* Imagine Foods, Inc. (California)

Vegetarian Cookbooks–Vegan Cookbooks–Do Not Use Dairy Products or Eggs. 640

Vegetarian Cookbooks. See also: Vegan Cookbooks. 154, 509, 617, 671, 791, 988, 1062, 1362, 1537, 1575

Vegetarian Diets–Medical Aspects–Cancer. 1252, 1370

Vegetarian Diets–Medical Aspects–Cardiovascular System, Especially Heart Disease and Stroke, But Including Hypertension (High Blood Pressure). 794

Vegetarian Diets–Medical Aspects–Mental Health. 377

Vegetarian Diets–Medical Aspects–Skeletal System Including Calcium, Teeth and Osteoporosis. 1537

Vegetarian Diets–Nutrition / Nutritional Aspects–Protein Quantity and Quality. 395

Vegetarian Diets–Nutrition / Nutritional Aspects–Vitamins. 377, 395

Vegetarian or Vegan Restaurants or Cafeterias. 211, 603, 759

Vegetarian pioneers. *See* Gandhi, Mohandas K. ("Mahatma") (1869-1948), Graham, Sylvester (1794-1851), Jackson, James Caleb (1811-1881), Seventh-day Adventists–White, Ellen G. (1827-1915)

Vegetarianism–Concerning a Diet and Lifestyle Free of Flesh Foods, But Which May Include Dairy Products or Eggs. See also: Veganism. 118, 130, 197, 211, 230, 339, 360, 377, 381, 383, 389, 390, 395, 397, 399, 415, 439, 446, 502, 505, 589, 603, 672, 697, 719, 759, 763, 798, 800, 826, 892, 1133, 1141, 1150, 1201, 1223, 1224, 1246, 1252, 1257, 1263, 1587, 1588, 1649, 1670

Vegetarianism–Efficiency of Plants Much Greater Than Animals in Producing Food from a Given Input of Energy, Land, or Water. Also Called Political Economy. 672, 697

Vegetarianism–Raw / Uncooked / Unfired Foods and Diet. 565

Vegetarianism–Religious Aspects–Judeo-Christian Tradition (Including Trappists, Mormons). See also: Seventh-Day Adventists. 502

Vegetarianism–Religious Aspects–Religions of Indian Origin–Buddhism (Including Zen), Hinduism, Jainism, Yoga, and Ayurveda. 794

Vegetarianism–Seventh-day Adventist Work with. 211, 230, 390, 395, 397, 399, 502, 589, 617, 640, 719, 759, 794, 1223, 1224, 1263, 1482, 1537

Vegetarianism–Statistics and Analyses on the Number of Vegetarians or the Size of the Vegetarian Products Market. 697, 794

Vegetarianism–Veganism–Concerning a Vegan Diet and Lifestyle Free of All Animal Products, Including Dairy Products, Eggs, and in Some Cases Honey and Leather. 1370, 1482

Vegetarianism and the Temperance Movement (Abstaining from Alcohol / Alcoholic Beverages) Worldwide. Incl. Teetotalism. 211

Vegetarianism, Athletics / Sports, and Athletes. 211, 565

Vegetarianism, the Environment, and Ecology. 697

Vegetarianism: Meat / Flesh Food Consumption–Statistics, Problems (Such as Diseases in or Caused by Flesh Foods), or Trends in Documents Not About Vegetarianism. See Also: Vegetarianism–Spongiform Encephalopathies /Diseases. 795

Velvet Bean. *Mucuna pruriens* (L.) DC. Formerly: *Mucuna utilis*. Formerly called Banana Bean (Rarely) or Velvetbean. 255, 257, 318, 320, 826

Vereenigde Ost-Indische Compagnie. *See* Dutch East India Company

Vestro Foods, Inc. *See* Westbrae Natural Foods

Viana Naturkost GmbH. *See* Tofutown.com

Videotapes or References to Video Tapes. 1607

Vietnamese Overseas, Especially Work with Soya. 888

Vigna mungo. *See* Black gram or urd

Vigna sesquipedalis. *See* Yard-Long Bean or Asparagus Bean

Vigna unguiculata or V. sinensis. *See* Cowpea or Black-Eyed Pea

Vitamins (General). 321, 347, 518, 1209, 1230, 1235, 1340

Vitamins B-12 (Cyanocobalamin, Cobalamins). 640, 952, 1528, 1589

Vitamins E (Tocopherols, Natural Powerful Antioxidant). 565

Vitamins in a vegetarian diet. *See* Vegetarian Diets–Nutrition / Nutritional Aspects–Vitamins

Vitamins. *See* Antivitamin Activity and Antivitamins

Vitasoy International Holdings Ltd. (Hong Kong Soya Bean Products Co. Ltd. before 24 Sept. 1990), and Vitasoy (USA) Inc., (Brisbane, California–south of San Francisco). Including Nasoya Foods (from Aug. 1990) and Azumaya Inc. (from May 1993). Founded by K.S. Lo (Lived 1910 to 1995), in Hong Kong. Started in March 1940. 1166, 1268, 1339, 1340, 1442, 1446, 1447, 1463, 1685, 1695, 1703, 1706, 1710, 1713

Vivisection. 399

Voandzeia subterranea or Voandzou. *See* Bambarra groundnuts

War Food Administration of USDA. *See* United States Department of Agriculture (USDA)–War Food Administration (WFA)

War, Civil, USA. *See* Civil War in USA (1861-1865)

War, Sino-Japanese. *See* Sino-Japanese War (1894-1895)–Soybeans and Soyfoods

War, world. *See* World War I–Soybeans and Soyfoods, World War II–Soybeans and Soyfoods

Waste Management, Treatment, and Disposal. See also: Environmental Issues and Concerns. 1197

Waterproof goods or cloth. *See* Linoleum, Floor Coverings, Oilcloth, and Waterproof Goods

Wax (soy) for candles. *See* SoyaWax International

Websites or Information on the World Wide Web or Internet. 1370, 1464, 1477, 1555, 1560, 1589, 1615, 1626, 1638, 1642, 1643, 1649, 1658, 1663, 1665, 1667, 1671

Wedge presses. *See* Soybean Crushing–Equipment–Wedge Presses

Weeds–Control and Herbicide Use. 95, 310, 385, 496, 627, 746, 758, 814, 868, 873, 934, 981, 1190, 1193, 1280, 1471, 1507, 1605, 1626

Weight of soybean seeds. *See* Seed Weight / Size (Soybeans)–Weight of 100 Seeds in Grams, or Number of Seeds Per Pound

Well (The), Pure & Simple, and New Age Distributing Co. (San Jose, California). 683

Westbrae Natural Foods, Inc. (Berkeley, California). Founded in Feb. 1971 by Bob Gerner. Later in Carson. Subsidiary of Vestro Foods, Inc. Acquired by the Hain Food Group of Uniondale, New York, 14 Oct. 1997. 1088, 1166, 1294, 1713

Western Samoa. *See* Oceania–Samoa

Wheat Gluten Made into Seitan (Including Wheatmeat, Tan Pups, and Tan Pops). 557, 1670

Wheat Gluten and Seitan Industry and Market Statistics, Trends, and Analyses–By Geographical Region. 1141, 1206, 1303

Wheat Gluten. 527, 528, 617, 631, 642, 658, 659, 708, 709, 717, 759, 794, 809, 907, 1047, 1141, 1206, 1224, 1303, 1390, 1482, 1658

Whip Topping (Non-Dairy–Resembles Whipped Cream but Contains No Soy Protein). 1302

Whip Topping (Non-Dairy–Resembles Whipped Cream or Whipping Cream and Contains Soy Protein). 1050, 1322

Whipping or foaming in soy proteins. *See* Soy Proteins–Isolates–Enzyme-Modified Soy Protein Isolates with Whipping / Foaming Properties Used to Replace Egg Albumen

White Wave, Inc. (Boulder, Colorado). Including Soyfoods Unlimited. Owned by Dean Foods Co. since 8 May 2002. 800, 1020, 1048, 1055, 1213, 1430, 1587, 1598, 1626, 1627

White soybeans. *See* Soybean Seeds–White

White, Ellen G. (1827-1915). Co-Founder of Seventh-day Adventist Church. 502, 589, 879, 907, 1374, 1634, 1643

Whitehouse Products, Inc. *See* Delsoy Products, Inc.

Whole Dry Soybean Flakes. *See* Microsoy Corp., Formerly Nichii Company

Whole Dry Soybeans (Used Unprocessed as Food). 211, 227, 230, 263, 294, 296, 312, 321, 360, 385, 390, 430, 481, 496, 511, 518, 527, 528, 565, 617, 640, 659, 668, 671, 791, 821, 822, 868, 881, 888, 955, 988, 1078, 1188, 1260, 1261, 1387, 1388, 1389, 1390, 1454

Whole Dry Soybeans, Ground or Mashed to a Paste After Boiling, or Ground Raw with Water to a Fresh Puree or Slurry (Including Japanese Gō). 502, 1490

Whole Soy Flakes (Flaked Soybeans), Grits, or Textured Products, Made from Whole Dry Soybeans (Not Defatted). See Also: Soy Flour: Whole or Full-fat. 401, 989

WholeSoy & Co. (subsidiary of TAN Industries, Inc.), Modesto WholeSoy Co. (California), and Aros Sojaprodukter (Örsundsbro, then Enkoeping, Sweden; Founded by Ted Nordquist. Started Feb. 1981). 1000, 1027, 1213, 1268, 1587, 1598

Wild Annual Soybean *(Glycine soja* Siebold & Zuccarini, formerly named *G. ussuriensis* Regel & Maack, and *G. angustifolia* Miquel). 60, 94, 95, 103, 152, 496, 738, 786, 827, 985, 1022, 1079, 1081, 1085, 1152, 1171, 1220, 1232, 1249, 1286, 1333, 1381, 1492, 1497

Wild Soybeans (General). 64, 544, 1321

Wild, Perennial Relatives of the Soybean–Glycine Species *(Glycine albicans, G. aphyonota, G. arenaria, G. argyrea, G. canescens, G. clandestina, G. curvata, G. cyrtoloba, G. falcata, G. gracei, G. hirticaulis, G. lactovirens, G. latifolia, G. latrobeana, G. montis-douglas, G. mycrophylla, G. peratosa, G. pindanica, G. G. rubiginosa, G. stenophita, G. syndetika, G. tabacina, G. pullenii tomentella)* (Former Names and Synonyms Include *G. sericea, and G. tomentosa).* 1, 2, 19, 44, 52, 56, 62, 94, 95, 98, 103, 123, 153, 155, 166, 168, 290, 327, 340, 353, 367, 372, 484, 495, 507, 520, 523, 553, 554, 569, 575, 681, 712, 721, 723, 738, 786, 787, 796, 827, 833, 966, 968, 985, 1019, 1021, 1039, 1060, 1064, 1077, 1079, 1081, 1085, 1129, 1136, 1142, 1152, 1160, 1162, 1171, 1193, 1200, 1215, 1220, 1222, 1243, 1280, 1286, 1295, 1315, 1316, 1326, 1328, 1344, 1381, 1429, 1444, 1492, 1497, 1505, 1558, 1563, 1622, 1633, 1639, 1683

Wild, perennial relatives of the soybean. *See* Neonotonia wightii

Wildwood Harvest, Inc. Formed on 24 Aug. 2001 by the merger of Wildwood Natural Foods, Inc. (Santa Cruz and Fairfax, California; started Nov. 1977) and Midwest Harvest, Inc. (Grinnell, Iowa; started Jan. 1999). 886, 898, 956, 975, 1027, 1210, 1214

Wildwood Natural Foods, Inc. *See* Wildwood Harvest, Inc.

Wilson soybean variety. *See* Soybean Varieties USA–Mammoth Yellow

Wing Seed Co. (Mechanicsburg, Champaign County, Ohio). Founded 1909. Including Joseph Elwyn Wing (1861-1915), Charles Bullard Wing (1878-1949), and David Grant Wing (1896-1984). 192, 482

Winged Bean *(Psophocarpus tetragonolobus)* (Also Called Four-Angled Bean, Goa Bean, Goabean, Asparagus Bean, Asparagus Pea, Segidilla, Seguidilla or Seguidillas Bean, Square Podded Pea, Square Podded Crimson Pea, *Botor tetragonoloba, Dolichos-,* or *Lotus tetragonolobus,* Pois Carré, Kecipir or Ketjeper, Calamismis or Kalamismis). 60, 64, 156, 255, 318, 487, 538, 688, 705, 781, 826, 855, 867

Woodworth, C.M. (1888-1960, Plant Breeder, Univ. of Illinois). 405

Worcestershire Sauce (Soy Sauce Was the Main Ingredient before the 1940s). Including Lea & Perrins. 25, 26, 27, 28, 32, 36, 39, 41, 43, 45, 46, 47, 48, 54, 57, 58, 67, 96, 100, 101, 109, 113, 180, 184, 273, 301, 317, 416, 419, 454, 730, 731, 732, 1084, 1191

Worcestershire Sauce–With Soy Sauce Used as an Ingredient. 96, 180, 273, 329

World–Soybean Production, Area and Stocks–Statistics, Trends, and Analyses. 347, 402, 422, 597, 857, 1313, 1424, 1560

World War I–Soybeans and Soyfoods. Also known as the "First World War" and "The Great War". 292, 422, 497, 583, 635, 673, 731, 955, 1047, 1385

World War II–Soybeans and Soyfoods. Also Called the "Second World War". 323, 439, 456, 460, 470, 471, 473, 488, 497, 534, 541, 542, 583, 635, 673, 718, 732, 893, 955, 989, 1047, 1050, 1051, 1082, 1084, 1088, 1294, 1322, 1340, 1387, 1388, 1394, 1541, 1628, 1699

World problems. *See* Hunger, Malnutrition, Famine, Food Shortages, and Mortality, Population Growth (Human) and Related Problems (Including Poverty), Protein Resources and Shortages, and the "World Protein Crisis / Gap / Problem" of 1950-1979, Sustainable Development and Growth

World. 313, 321, 325, 385, 406, 422, 438, 496, 497, 529, 625, 691, 698, 715, 734, 741, 742, 802, 803, 831, 857, 868, 877, 900, 986, 1008, 1029, 1080, 1083, 1092, 1110, 1147, 1195, 1208, 1424, 1560, 1596, 1630, 1648, 1700, 1708, 1712, 1713

Worthington Foods, Inc. (Worthington, Ohio). Including Battle Creek Foods (Michigan) from 1960, and Madison Foods (Tennessee) from 1964. A subsidiary of Miles Laboratories from March 1970 to Oct. 1982. Including Loma Linda Foods from Jan. 1990. 617, 640, 658, 698, 879, 1047, 1203, 1230, 1275, 1463, 1477, 1482

Yamasa Corporation (Choshi, Japan; and Salem, Oregon). 218

Yamato Tofuhaus Sojaprodukte GmbH. *See* Huegli Naehrmittel A.G. (Steinach-Arbon, Switzerland)

Yard-Long Bean or Asparagus Bean–*Vigna sesquipedalis* (L.) Fruw. 307

Yellow soybeans. *See* Soybean Seeds–Yellow

Yeo Hiap Seng Ltd. (Singapore and Malaysia) and Affiliates. 1713

Yield Statistics, Soybean. 110, 115, 121, 133, 190, 214, 215, 246, 247, 251, 255, 256, 258, 261, 269, 273, 279, 295, 296, 310, 313, 318, 321, 343, 373, 375, 378, 379, 385, 408, 418, 467, 473, 478, 488, 512, 533, 536, 538, 539, 555, 558, 562, 564, 572, 579, 580, 583, 591, 596, 597, 598, 599, 600, 601, 602, 605, 611, 618, 621, 622, 624, 626, 627, 628, 636, 639, 647, 653, 660, 682, 688, 690, 702, 727, 736, 737, 746, 747, 748, 792, 802, 803, 814, 831, 837, 838, 865, 872, 873, 900, 917, 925, 932, 934, 939, 957, 976, 981, 986, 1008, 1017, 1126, 1190, 1276, 1313, 1332, 1534, 1699

Yogurt, soy. *See* Soy Yogurt

Yuba (The Film That Forms Atop Soymilk When It Is Heated). In Chinese Called *Toufu Pi* ("Bean Curd Skin"). 53, 61, 87, 91, 93, 296, 307, 321, 385, 402, 407, 763, 821, 822, 826, 1037, 1047, 1163, 1559, 1642

Yuba–Etymology of This Term and Its Cognates / Relatives in Various Languages. 53, 61

Yuba–Imports, Exports, International Trade. 53, 87, 91, 93, 296

Yugoslavia. *See* Europe, Eastern–Serbia and Montenegro

Yves Fine Foods (Founded by Yves Potvin, Feb. 1985, Vancouver, BC, Canada). Renamed Yves Veggie Cuisine in 1992. Acquired by Hain Celestial Group in June 2001. 1659

Zaire. *See* Africa–Congo (formerly Zaire). Officially Democratic Republic of the Congo. Also known as Congo-Kinshasa

Zea mays. *See* Corn / Maize